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Defense Management Journal

First Quarter 1980

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A NEW LOOK IN
ARMY BASIC TRAINING

in brief

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THAT RED CARPET ATTITUDE

An interview with
Rear Admiral Charles E. Gurney III, USN

Just before he relinquished the reins of the Military Enlistment Processing Command in the fall, Rear Admiral Charles E. Gurney III was interviewed by the *Defense Management Journal*. In the interview, he candidly shares his views on a diversity of topical matters associated with military recruitment and enlistment processing.

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THE CHANGING FACE OF ARMY BASIC TRAINING: MORE FLEXIBLE AND COEDUCATIONAL

Thomas J. Gelli

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The *Defense Management Journal* is a quarterly publication of the Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics). The *DMJ* publishes articles on current defense policies and on methods for improving defense management. Unless otherwise stated, the views herein are those of the authors and are not necessarily those of the Department of Defense or any of its elements.

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Secretary of Defense: Harold Brown. *Assistant Secretary of Defense (MRA&L):* Robert B. Pirie, Jr. *Editor:* Larry J. Wilson. *Managing Editor:* Thomas J. Gelli. *Associate Editor:* Carolee B. Hartman. *Secretary:* Susan L. Rae.

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A theme focus and a revised schedule for the 80s

With this issue, the *Defense Management Journal* commences publication on a quarterly basis once again. This change, which ended a two-year experiment with bimonthly scheduling, was primarily prompted by the creation of a sister publication to the *DMJ* tentatively entitled *Defense Management Research Focus*, whose editing and production will also be handled by the *DMJ* staff.

The semiannual *Focus* will showcase articles which more heavily emphasize ongoing scientific research in the areas of manpower, reserve affairs, and logistics. The inaugural issue will be published in January 1981.

The quarterly *DMJ* will focus four to six articles per issue on a specific theme. This First Quarter 1980 issue spotlights enlistment processing and management of coeducational basic training. In the next two quarters we'll direct your attention to human resources management and training and simulation devices.

In addition, the *DMJ* will continue publishing at least half a dozen general management articles on a wide variety of subjects in each issue. This first issue, for example, presents one article depicting DoD's efforts to combat fraud and waste and another describing the Presidential Management Intern program. There are also articles on labor-management relations at Tinker Air Force Base, a technology transfer effort at China Lake's Naval Weapons Center, and personnel research initiatives in the Navy. Next issue will include articles on life-cycle costing, Navy research on female attrition, and some logistical considerations on the F-15.

Regularly appearing departments such as letters to the editor, news summary, and calendar will be joined by several new departments, including an editor's page (with occasional guest editorials) and a congresswatch, which will detail the status of pending legislation that affects DoD. And we'll continue to bring you synopses of the best reports on defense-related issues as we come across them.

The editors of the *DMJ* believe that the switch to a quarterly publication and the creation of a related research review are in the best interests of the magazine's readership. We hope you will agree.

call for papers

A new research review on the horizon

In January 1981, the staff of the *Defense Management Journal* will commence publication of a new magazine, tentatively entitled *Defense Management Research Focus.* Devoted to the dissemination of state-of-the-art scientific information, the *Research Focus* will publish research and expository papers relevant to Defense Department efforts to improve management in the areas of manpower, reserve affairs, and logistics. Article disciplines will include mathematics, statistics, and economics.

The first issue of the new journal will deal exclusively with attrition and retention management in the military services. While we are individually inviting certain authors to submit articles, we also encourage all manpower researchers to submit their proposals.

If you have an idea for a research article, contact Larry J. Wilson at (703) 325–0340 or AUTOVON 221–0340 to ensure that your proposed theme and approach are appropriate for the *Research Focus*. If you have already prepared an article, forward four copies of the typewritten, double-spaced manuscript to:

Editor
Defense Management Research Focus
OASD (MRA&L)
Cameron Station
Alexandria, VA 22314

By submitting four copies, you will expedite the review process. Each manuscript considered suitable to the new publication will be reviewed by at least three referees.

An abstract of approximately 100 words should accompany each manuscript. We also request of each author a brief biography, home and work addresses, and commercial and AUTOVON telephone numbers.

As a government publication, the new research journal is not authorized to compensate authors monetarily for papers which are accepted for publication; however, authors will receive a number of copies of the issue in which their article appears.

Research articles must be submitted by August 1, 1980, and authors are heartily encouraged to respond prior to that deadline.

Discounting hardly a key issue

Sir: The recent publication of Professor Richard Thaler's "Why discounting is always right" (Sept.–Oct. 1979) continues the debate on an issue that is far from one of the key issues in defense analysis.

It seems to me that many of the differences of opinion appear to stem from the poor communication between the theoreticians and the defense economists who work in the trenches of the annual budget and program-budgeting process. No one can successfully argue that all significant factors affecting the relative costs and effectiveness of alternatives should not be taken into account. From this perspective, the theoreticians are correct using their academic models of the world, as long as they also take account of inflation, the second effect of unequal time streams.

On the other hand, in the real world, the academic model is seldom relevant and discounting seldom a deciding issue. Pragmatically, the services cannot ask congress to appropriate money next year that congress is willing to appropriate this year. For all intents and purposes, a new Table of Allowances is perishable to the services. They get it when they can for specific projects and spend it or lose it. Much of the services' budgets is highly non-discretionary (manpower and direct operating costs) and these funds are expended on a current-year basis. The remainder is approved through the service-OSD-OMB-congress chain on an item-for-item basis and the various decision makers are not indifferent among items. This year, for example, congress added money for a Navy nuclear carrier. It is doubtful if the Navy officials could successfully say, "The Navy will take the money but based on discounting, the Navy would like to use the added funds for a maintenance project this year and take the carrier money next year in lieu of maintenance money." More than likely, the funds would be lost because congress is not likely to operate that way. The multi-year perspective is just not there in the real world.

A large part of the problem appears to come from people using the terms *fixed budget* and *fiscally constrained budget* synonymously. The defense budget is not fixed. A review of the evolution of a budget or of historical data will demonstrate this. The budget is fiscally constrained—that is, it will be raised or lowered only on a specific item basis. The academic model is consistent with a fixed-budget concept where the services are free to use the funds at their own discretion and to move funds and projects around from year to year. The academic model is inconsistent with the reality of a fiscally constrained budget when money is provided for specific projects only, and cannot be shifted at the services' discretion or expended in whatever year the services choose. Thus, in terms of the academic model, the effective discount rate in the real world of defense is zero.

It is difficult to avoid the observation that while Dr. Thaler and his ilk may be fully employed academicians, they seem underemployed as defense economists. The hard and pressing problem is that costs are growing in real terms and other severe cost growth is being accepted and excused under the names inflation or escalation. People with economic skills are vitally needed to help understand and solve the cost-control problem so as to reverse the deterioration in force levels and capability. The sort of mental gyrations represented by the discounting debate might constitute fun for some but is not very productive.

ROBERT R. GIGLIOTTI
Haymarket, Virginia

Counter-counterargument

Sir: In an earlier issue of the *Defense Management Journal* (March 1978), I stated that discounting costs at some arbitrary rate like 10 percent was improper if managers were operating within a constrained budget—a budget that is specified in advance and which cannot be changed through borrowing, lending, or augmentation. In the September–October 1979 issue of *DMJ,* Professor Richard Thaler countered that discounting is *always* proper.

He based his argument on two premises: that there always is some positive return on invested funds (though in DoD such investment might have to occur internal to the organization instead of through an external source such as a bank) and that using a zero discount rate is the same as assuming the opportunity cost of funds is zero; that is, that budgets are not constrained. I disagree. Zero discount rates can apply when the opportunity cost of funds is positive; it is only necessary that the budgets are just as constraining in future years as in current years.

Dr. Thaler provides examples of internal investments, including cost-saving expenditures, conservation measures, and preventive maintenance. He states that if these kinds of expenditures have positive rates of return, the manager can invest money just as if he were putting the money in a savings account. That is questionable. First, all alternative investments are already part of the decision process, at least in theory. Rather than producing extra dollars in the budget downstream, such investments merely save expenditures at some point in some budget. But those saved expenditures are spent on another project anyway, and that other project is also considered in the decision process. To be selected, such internal investments must increase effectiveness, which is what the entire decision process is all about.

Put another way, once all the project choices are shuffled around to an absolute optimum, effectiveness is maximized subject to budget constraints. And that is what was supposed to be done. The internal investments are part of the optimization process.

According to Dr. Thaler's first example, the choice between two equally effective projects, A and B, augmented by two equally effective maintenance projects, C and D, is quite clear when A and D are compared to B and C. But A and D together would be a project in its own right, competing with A, with D, and so on in the fiscally constrained decision process. All the selections must still fit within the budget, and Thaler's internal investment already seems to be incorporated in the project selection under fiscal constraints.

While the theory behind internal investment under fixed budget needs exploring, it is doubtful that significant and widespread opportunities for such internal fund raising exist. Even the example casts doubt on the concept. The sample maintenance project is required next year for $215, but it can be completed at the same level of effectiveness this year for only $200. This implies that many maintenance projects can be accomplished when the budgeteer chooses, rather than when they are due. But if maintenance is needed next year, then it is needed next year, not this year. Would the maintenance project be equally effective if done this year or next year? If this is an example of internal investment then the argument that there are enough such opportunities to avoid budget rigidity seems suspect.

In what seems to be a flaw in his logic, Dr. Thaler writes, "So when would it be right to use a zero discount rate? Such a rate implies the opportunity cost of funds is zero, . . . [which] would be a case where DoD was truly unconstrained . . . . " It is crucial that analysts understand the correct relationship between constrained budgets and discount rates. Assume the objective is to maximize effectiveness, subject to remaining within budget constraints. Then a totally unconstrained budget means there is no increase in effectiveness if an extra dollar is added to the budget. Dr. Thaler contends this is equivalent to a zero opportunity cost. But the opportunity cost does not have to be zero to yield a zero discount rate. If an extra dollar in year one provides one unit of effectiveness, and an extra dollar in year two provides one unit of effectiveness, then neither budget has zero opportunity cost. Yet, the proper discount rate between periods one and two *is* zero because there is no incentive to transfer funds between periods.

In a limited set of purely financial situations, it indeed turns out that a zero discount rate implies a zero opportunity cost. This is true when the objective is to maximize profits. In profit maximizing, an extra dollar in funding would not be spent unless a profit (revenue less the dollar cost) were positive. Then the marginal return (the profit per dollar) is equal to the discount rate r. But a more general financial problem is to maximize *revenues* subject to funding constraints. This situation covers both profit and nonprofit organizations. In such a problem, the opportunity cost is not equal to the discount rate r but to $1+r$. Thus, the interest rate is zero when the opportunity cost is unity, not when it is zero. Budgets can have zero discount rates, but still have positive opportunity cost; that is, they have positive marginal returns. In fact, it is easily shown that the proper discount rate between periods in this problem is derived from setting $1+r$ equal to the *ratio* of the two opportunity costs. Thus, Dr. Thaler's basic assumption that zero discounting means unconstrained budgets is false.

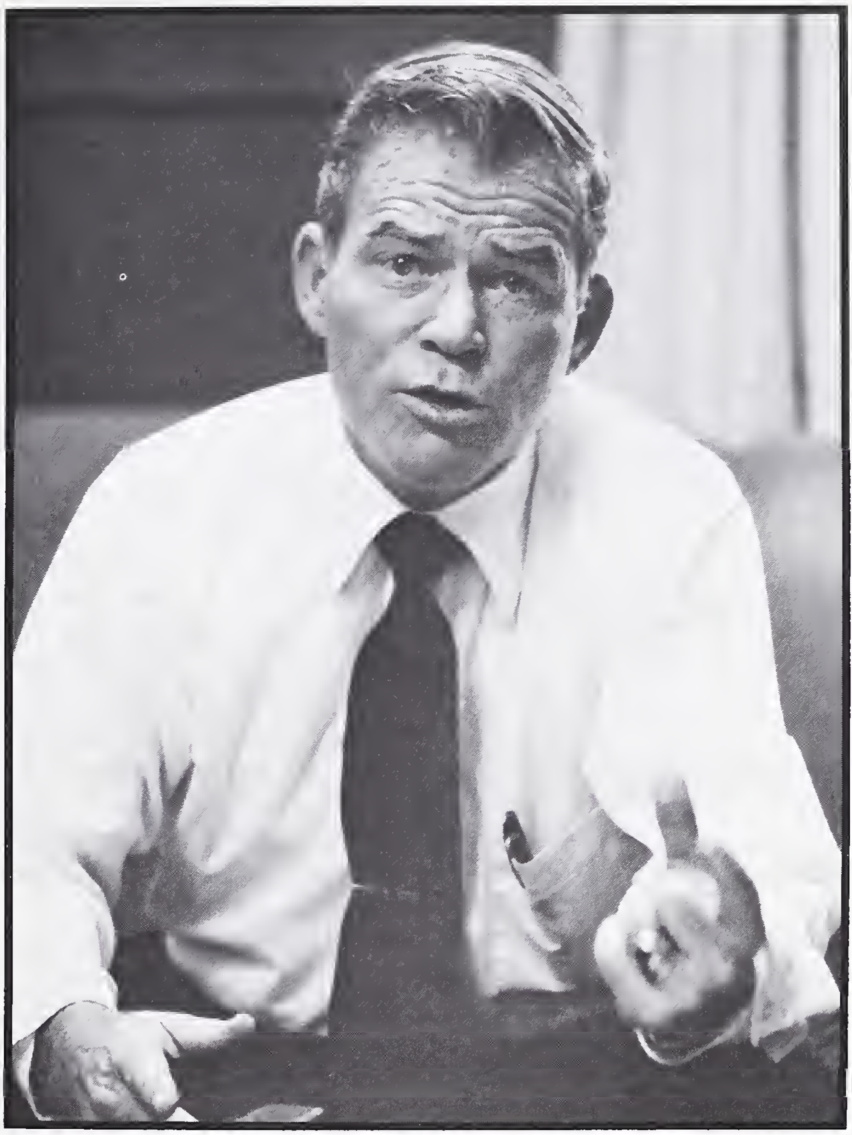
One might argue on theoretical grounds that the inter-period discount rates imputed by comparing the relative values of different budgets are dependent on the relative value of effectiveness in different time periods—that is, on some relevant discount rate for effectiveness. I agree. However, the relative value of effectiveness in different time periods is dependent on the threat scenario posed by the potential adversary, and is certainly not dependent on financial fund rates like 10 percent. Consequently the time value of effectiveness is not related to the time value of money, and financial interest rates cannot be rationally imposed on the budgets as second-best solutions.

Some will argue that discounting at an arbitrary 10 percent when comparing two projects in isolation somehow helps offset natural inefficiencies in the DoD optimization process. That does not seem likely, especially if one considers another related aspect. The use of high discount rates forces the selection of projects with deferred costs. Deferred costs are those farthest into the future and those with the greatest uncertainty. In other words, by using high discount rates, managers will choose those programs with the highest cost uncertainty. The wisdom of doing that depends on the validity of the estimates of those downstream costs. There are many who feel managers tend to underestimate future costs to a much greater degree than they do present costs. If that is so, one must ask how discounting at high rates makes defense decision-making more efficient.

ROLF CLARK
Commander, USN

That red carpet attitude

An interview with Rear Admiral Charles E. Gurney III



Photos by Larry J. Wilson

In October 1979, the Military Enlistment Processing Command became organizationally independent of the U.S. Army Recruiting Command. Responsible for conducting physical and mental examinations and enlistment processing for each of the service's recruiting functions, MEPCOM operates some 68 Armed Forces Examining and Entrance Stations throughout the country, where new recruits get their first glimpse of life in the military.

At the time of this interview, Rear Admiral Charles E. Gurney III was conducting his tour of duty as commander of MEPCOM, a position that enabled him to gain a unique perspective on recruiting and enlistment processing. Here he shares his observations and personal opinions on everything from the matter of enlistment standards to the problem of doctor shortages and the effectiveness of DoD's high school testing program.

Interview by Larry J. Wilson, DMJ editor

DMJ. You have been the commander of the Military Enlistment Processing Command for sixteen months now. What would you describe as your greatest accomplishment during that period?

Gurney. It's not what I've done, it's what the staff has done, and that is that we have come to be viewed as an equal partner in the recruiting system. Once there was some concern about equal effort in supporting all the services since MEPCOM reported to USAREC, the Army Recruiting Command. That is no longer the case. We've worked very hard at providing fair and equal service to all of the recruiting services. And we've worked a lot on giving good service to the people who come to the AFEES.

DMJ. What kind of help does the military need from the executive and legislative branches in order to make the all-volunteer force work?

Gurney. Number one, our leaders need to get across to all Americans, young and old, the basic need for national defense. I don't believe that the American public is convinced of this need. We have to convince them that the process which decides that the armed services need 2.1 million people is a democratic process, and that it's performed by people who really have all of the information necessary to make that decision. Number two, our national and civic leaders should stress that service in the military is an honorable thing to do. A youngster needs to feel that his peers and his parents view it as a decent vocation. Number three, the salary-and-benefits package has to match the expressed need for manpower. We have to show youngsters coming out of high school that the country needs them, that it is willing to compete with American industry for the available labor pool, or else these young people are going to say that society puts its money where its needs are and that's where they are going to work.

DMJ. Along that line of thought, then, is recruiting being adversely affected by the fact that military cost-of-living increases are tied to those for civil service?

Gurney. This is strictly my own opinion. The youngster coming into the service today does look at pay and allowances. But he's looking at something he doesn't have yet, so I don't think he is very concerned. The people we are losing are the second-termers. They get pretty upset when they see a pay cap or see a benefit that they have been living with disappear. Many new recruits, though, are looking at the training opportunity, and perhaps travel and adventure.

DMJ. So the compensation package is less important to first-term recruits than it is to reenlistment eligibles?

Gurney. Only to a degree. It's especially important if you hope to recruit high school graduates or youngsters with a year or two of college. A good example is one close to home for me. I have a 21-year-old son with 2½ years of college who dropped out of school for a year to make his fortune. He went down to Underwriter's Laboratory here in Chicago and took a test and they hired him as laboratory technician for $13,000 a year. Someone else can get paid $8.50 an hour to sweep out trucks for United Parcel Service. In the northern tier of the country, where unemployment is reasonably low and kids are able to get a job, the compensation package the military has just doesn't cut it. A young person doesn't need to even consider the military. Society has told him that he is more valuable in Underwriter's Laboratory than he is in the Navy.

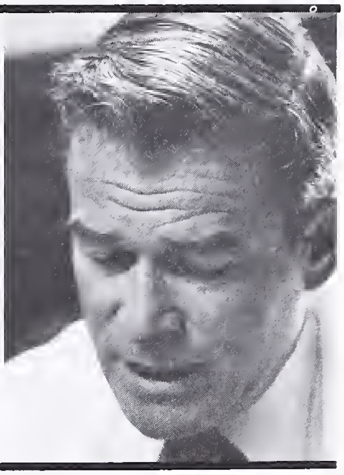
DMJ. The implication, then, is that the compensation package is much more important to the achievers, the cream of the crop coming out of the high schools?

Gurney. Absolutely. When I speak at, say a Rotary Club luncheon, I hear businessmen say that we should return to the draft, that the all-volunteer force is too expensive. And I'll turn to this businessman and say: why don't we draft for your hardware store. We'll send you four people whom you must employ and we'll limit their wages to $1.50 an hour. It'll be simpler for you because your labor costs will be practically nothing. Of course, you may have a problem with unexcused absences, and you may have a problem with the quality of this person's work, and you may have a problem motivating him to stock your shelves. But let us have the high salary-and-benefits package and we'll have five people applying for every job in the armed forces. The four we don't take you can have.

The military ought to have a benefits package which allows it to compete for the quality of youngster it takes to run a very highly technical military force. We're not just looking for shovel labor.

DMJ. Recruiting scandals have been widely reported in the press lately. What is being done to eliminate opportunities for fraud?

> “The compensation package the military has just doesn’t cut it . . . . I have a 21-year-old son with 2½ years of college who dropped out of school for a year to make his fortune. He went down to Underwriter’s Laboratory here in Chicago and took a test and they hired him as a laboratory technician for $13,000 a year . . . . Society has told him that he is more valuable in Underwriter’s Laboratory than he is in the Navy.”



Gurney. One of the best ways to reduce fraud is to have so many versions of the test that it doesn’t pay to memorize. In the past there were only two versions of the test, but since last July we’ve had four versions. And each version has a different order of questions and of answers. So I think we’ve already eliminated the value of a bootlegged test by practically 90 percent.

Now we’re revising the ASVAB (Armed Services Vocational Aptitude Battery). At the start of FY81, there will be six versions of a new test. I think that will go a long way toward eliminating cheating. Of course, making multiple tests equally difficult is not a simple task.

DMJ. Assuming the test isn’t somehow compromised, how accurately does it assess mental abilities?

Gurney. It is a pretty good general indicator, but it is by no means a surgical tool. It gives a broadly based relative standing. If I were a high school counselor, I’d want my kids to know that. But overall it’s a good test, especially at the high mental levels. It’s not as good at the lower levels but we’re going to correct that in 1980, too.

DMJ. How is the Aptitude Battery viewed by school administrators?

Gurney. Their attitudes vary widely. There are some high schools that absolutely refuse to have anything to do with a DoD-sponsored test. They won’t allow their students to take it on school time. But the majority of schools—some 15,000 out of the 21,000 high schools in America—allow us to test. That’s not bad, and we’re working on the others.

DMJ. Is the testing program effective at generating leads for recruiters?

Gurney. If I had to pick one thing that is the most effective generator of leads to recruiters, it would have to be the institutional ASVAB. The high school testing program is absolutely vital. We generate about a million valid leads a year through it.

DMJ. Valid in what way?

Gurney. By valid I mean that the kid lives at the address that is listed, that’s the phone number, that’s the age, that’s the sex. Some of the students have already qualified mentally by the time the recruiter gets a name. With advertising, on the other hand, some unfortunately will tear a card out of a magazine and send it in signed Mouse comma Mickey, or they’ll use bogus addresses and phone numbers. There is no way you’ll get a nuisance card through ASVAB because the kid who takes a three-hour test has shown a little bit of interest to begin with.

As you can no doubt tell, I’m a very, very strong supporter of the institutional testing program. I’d like to see us give the test to two million, maybe three million students a year.

DMJ. Is such a figure possible?

Gurney. I think so, but some changes are necessary. First, we’ve got to have publicity. Then kids have to want to take it, which means that high school counselors have to believe in it. We, along with the recruiters, have to do a better job of making ASVAB available. And we should attempt to shorten the test. Three hours is too long a block of school time.

DMJ. I’ve visited a number of entrance stations during the past two years, and I’ve observed a wide

"Red carpet treatment is an attitude, a fundamental daily philosophy. It's workers in the AFEES who are friendly, courteous, well-dressed. Red carpet means that the individual is treated fairly and everything is explained to him; that the facility is clean; that the activity is well-organized; that there is as little waiting as possible; that the paperwork is accurate so that when you send someone to the airport, there will be a reserved seat on that airplane for that person."

disparity in the quality of the AFEES buildings. Los Angeles, for example, is a clean, modern building that seems readily designed for processing recruits. Then you have a Ft. Hamilton in New York, which is an old building that wasn't designed to be an AFEES facility. How does MEPCOM accommodate this difference in the context of "red carpet treatment"?

Gurney. We run the gamut of facilities, from an old Army barracks in Des Moines, Iowa, to a brand new federal building in New Orleans that has piped-in music and all that sort of thing. But red carpet treatment is more than that; it is an attitude, a fundamental daily philosophy. It's workers in the AFEES who are friendly, courteous, well-dressed. Red carpet means that the individual is treated fairly and everything is explained to him; that the facility is clean; that the activity is well-organized; that there is as little waiting as possible; that the paperwork is accurate so that when you send someone to the airport, there will be a reserved seat on that airplane for that person.

At places like the Ft. Hamilton AFEES, we're continually trying to upgrade the facility. We try to put carpets in the waiting rooms. We try to improve the family lounges. All of the ceremony rooms, where the youngster takes the oath of office, are very well done and very dignified. That is an important moment in that person's life and we want him to remember it. **[Editor's note: A photo feature on recent improvements at Ft. Hamilton appears on page 12 of this issue.]**

DMJ. One crucial problem affecting the military is the doctor shortage. In visiting numerous entrance stations, I've observed that almost all of the doctors examining recruits are at least 50 years old. Why is there such a preponderance of older MDs at the AFEES?

Gurney. In part because a young doctor starting out doesn't feel that giving physicals all day is satisfying work. They like to see patients and practice their medical skills. But for a doctor who has done that for 35 years and has a wealth of experience in diagnosis, it's a nice second career. He gets to deal with young people, he's doing a patriotic service, and he is using his years and years of medical skills in the diagnostic process of giving a physical.

DMJ. Does the monetary compensation you can offer affect your ability to find enough doctors?

Gurney. I think the compensation scale right now is just a bit low in many areas of the country. We've been able to fill about 85 percent of our medical positions, and considering the country-wide shortage of MDs, I'd say our peacetime shortage is not too critical. But we can't afford to have any AFEES in the country uncovered, even for a day. So we contract for doctors on a fee basis when we have to.

But I don't like to do that. I believe it is especially important to have a permanent chief medical officer at each AFEES, someone who is familiar with the standards of the armed services, understands the paperwork, and promotes the red carpet spirit. We've got the same problem with physicians regarding the red carpet attitude as we do with anybody else. We try very hard to work with them and improve their bedside manner.

DMJ. You said that about 85 percent of your medical positions are presently filled?

Gurney. That's correct. Out of 68 AFEES, I'm short nine chief medical officers. Those are positions we have to fill with fee-basis doctors, and that costs the American taxpayer more. That's one reason I've asked for a more competitive dollar-compensation package. We haven't kept up with inflation.

Let me add, though, that I think the part of our mission we do best is physicals. We have superb laboratory procedures. We use very sophisticated audiometric equipment to establish a hearing base, so if there is a hearing loss, we can tell how much of it is service-connected. These days, hearing is a very important industrial compensation item.

DMJ. Are there any innovations in processing recruits on the horizon?

Gurney. While it is a relatively simple procedure, pregnancy testing is a remarkably innovative idea. In the past six months, I'd estimate that we've saved the taxpayer over a million dollars by detecting pregnancies prior to enlistment. By doing so, we save the woman a lot of disappointment and the system avoids the cost of travel, training, and uniform issue.

We are presently looking at ways to conduct stamina tests at the AFEES, too. We'd like to know before enlistment whether the individual's cardiovascular system is capable of handling the physical development that goes on throughout recruit training.

We're also taking a hard look at computer adaptive testing. It effectively minimizes the possibility for widespread cheating, it shortens the test to 20 or 30 minutes, and it quickly homes in on the mental group by selecting succeeding questions based on the answer to the previous question. A smart kid doesn't have to sit through an hour and a half of easy questions, and the kid who isn't quite as bright doesn't have to endure as many questions that he doesn't know the answers to. That's down the pike—maybe 1983 or 1984.

DMJ. Why will it take so long to develop?

Gurney. It's a state-of-the-art problem. Someone has to write the questions so that the test you give to one person can be validly compared to the one given to another. That is no simple task. But there isn't any question in my mind that that's the way all testing is going to go in the next 10 years. It's neat and it's clean because there is no pencil and paper. The scores are automatically computed and are absolutely accurate. And there is no cheating.

DMJ. I understand that MEPCOM has begun using civil servants to conduct the high school testing program at mobile test sites. How is this working out in comparison to the past, when military testers were the norm?

Gurney. Super. We should have done it five years ago. Our record of reliability is better using the civil service testers. We are giving better service to the recruiting forces because we can give them more sites. And it's much more cost-effective. In the last year under military testing, our cost was about $150 per session. Now we pay $55 per session, no matter how many people are tested.

DMJ. Is there anything you regret not having accomplished in the 16 months you've been commander of MEPCOM?

Gurney. Oh, yes. I would have liked to have had more versions of the ASVAB quicker and to have improved our diagnostic capability earlier. I really would have liked to have done more on the high school program. In both of the school years I've been here, the number of students tested has declined. Even though I was trying to reverse a trend which has continued for the past four years, I consider that a failure. And I'm not happy with the nine medical vacancies at the AFEES.

DMJ. What could you have done about that?

Gurney. We could have contacted the services and approached military doctors who were retiring. We could also have done a better job of recruiting in local medical societies by getting our commanding officers and other doctors out talking it up, doing a better job of community relations. We're doing both of these things now, but we didn't start on it soon enough. We just didn't anticipate the problem in its fullest context.

DMJ. Admiral, do you have any final thoughts you'd like to leave with our readers?

Gurney. One thing. My impression after 16 months here is that the quality of the young Americans joining the armed forces today is as good as it's ever been in my 27 years in the Navy. In terms of physical stamina, intelligence, and motivation, these people are every bit as good. And I'm proud to serve with them. DMJ

Upgrading an old AFEES facility

By Larry J. Wilson, *DMJ* Editor

That red carpet attitude includes little things like attractive wall decorations and attention to the individual's needs.

Posters like this are designed to attract young men and women to the armed forces by visually representing some of the civilian-applicable skills that can be acquired through service.

A person entering the Armed Forces Examining and Entrance Station at Fort Hamilton, New York, can't help but notice the poster in the lobby of the building. Stretching from floor to ceiling and spanning the entire width of the wall, the poster is a mammoth photograph of an aircraft carrier at sea.

Other photos and posters in the lobby and recreation room at the Fort Hamilton AFEES portray men and women working as automotive mechanics and traffic police, among other things. Seemingly, the idea is to attract young men and women to the armed forces by visually representing some of the civilian-applicable skills that can be acquired in a couple of years of military service.

The approach is simple, yet effective. Above the aircraft carrier, for example, are the words "Our College of Advanced Electronics," the implication clearly being that if one can handle the job of electronics technician on a highly sophisticated ship like this, one has acquired a college-level proficiency that should prove invaluable throughout life. Training in the Navy is money in the bank, the poster seems to say.

Improving the visual character of an old building like the one at Fort Hamilton is just a part of MEPCOM's red carpet treatment. Waiting rooms and family lounges are being carpeted and paneled. For those few recruits whose processing has been de-

Photos by Larry J. Wilson

(Top right) ***Under construction are dressing booths that offer women maximum privacy.*** **(Lower right)** ***For recruits whose processing has been delayed, cushiony chairs ease the wait.***

layed for one reason or another, cushiony chairs and couches in the lounges soften the strain of waiting.

This policy of accommodation is also evident in the renovation of the wing in the AFEES where women undergo physical examinations. Presently under construction are individual booths that provide maximum privacy for dressing and undressing.

As Rear Admiral Charles E. Gurney III, former commander of MEPCOM, said in the interview preceding this article, "Red carpet treatment is an attitude, a fundamental daily philosophy." Clearly, it is also the little things, like posters of real people on walls and attention to the individual's needs. DMJ

The high school testing program: a cost-effective recruitment tool

By Gus C. Lee

For two decades, vocational testing has helped military recruiters identify qualified prospective enlistees.

The Armed Services Vocational Aptitude Battery is a high school testing program that helps students to identify their vocational strengths and weaknesses. For the student, the test is an aid in deciding what to do after graduation. For the military services, it has proven to be a particularly cost-effective recruiting tool.

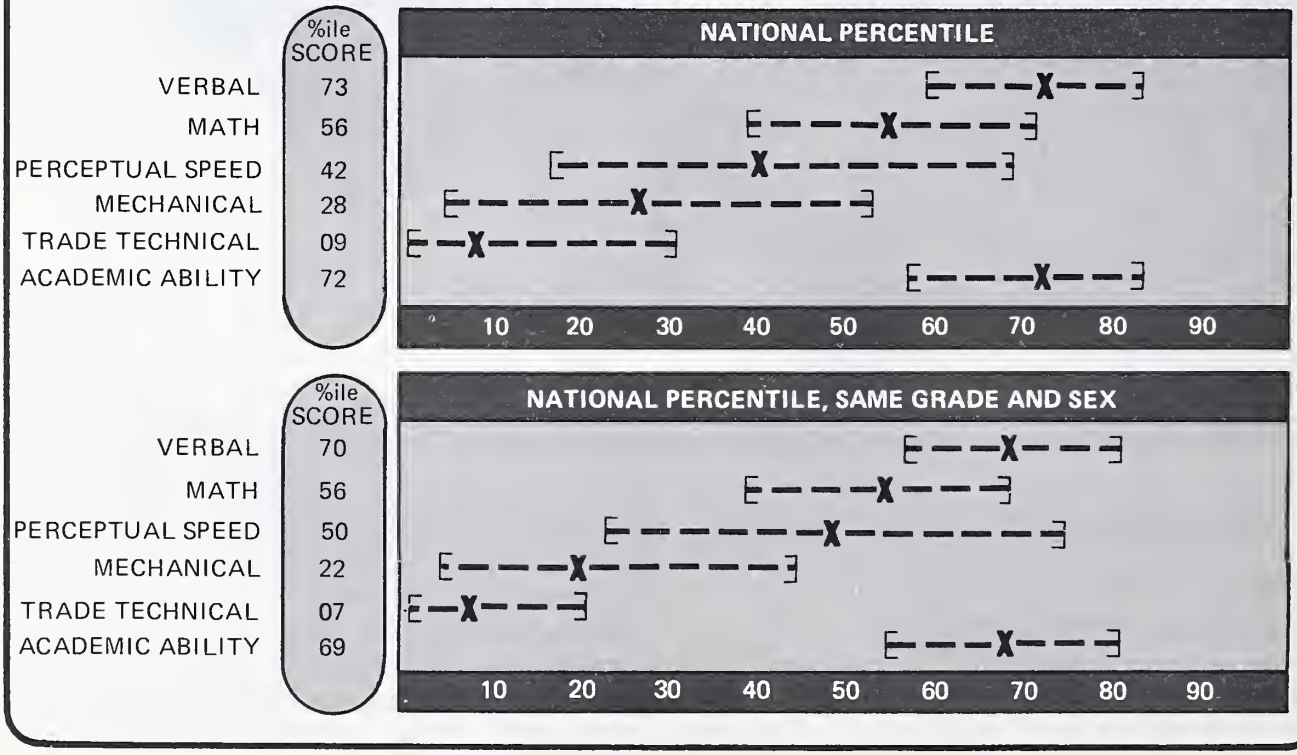
Each year more than one million students in nearly 15,000 high schools take this aptitude test. Of that total, as many as 100,000 subsequently enlist in the armed services. While some of those enlisting had already considered doing so before taking the test, many others decide to enlist after the test stimulates their interest in military service and a recruiter contacts them. Typically, 30 percent of those taking the test state that their future plans are uncertain; after the test, more than half of this group enlists.

High school students take the exam free of charge and without obligation. They receive test scores in academic ability as well as in five aptitude composites: verbal, quantitative, clerical, mechanical, and trade technical (see sample questions on page 19). Using the test results, a counselor can advise individual students about their proficiencies or recommend compensatory study. The comparative data also help school counselors identify strengths and weaknesses of students in broad comparison to students nationwide (see Figure 1).

The high school testing program began as a recruiting initiative in 1958 when the Air Force administered a qualification examination in a number of high schools. Test scores of seniors were sent to recruiters, and all of the participants' scores were given to school counselors.

The other services soon followed and began administering their own tests. Then, in 1968, partly in response to complaints from high school officials about the competing service programs, the Department of Defense established the joint-service high school testing program, using one common test, the

Figure 1. The score sheet for the aptitude test shows the student how he or she compares nationally and to other students of the same grade and sex



Armed Services Vocational Aptitude Battery.

In 1976, a version of the ASVAB was introduced for use by all services as the standard entry test for enlistment applicants. Today, if an applicant has already taken the ASVAB in high school, he or she need not retake the test in order to enlist.

Responsibility for the routine operations of the program is shared by the recruiting services and the Military Enlistment Processing Command. The recruiting services contact the high schools and promote and market the test, while MEPCOM administers the test and directs the program. At the local level, interservice recruitment committees, composed of the commanders of the local recruiting organizations, ensure coordination and cooperation between the recruiting services and MEPCOM.

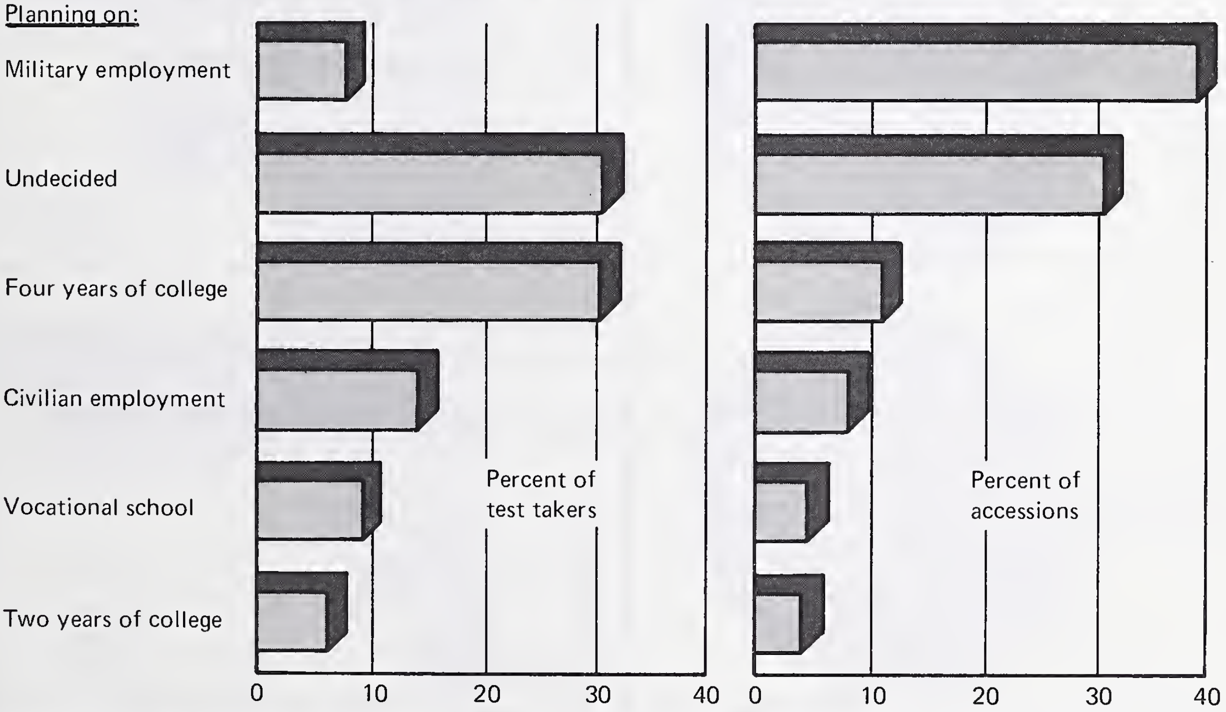
By providing a free testing service to the high schools, the testing program serves as an effective public relations mechanism. Indeed, in marketing the test to the high schools, the services stress its value as a general guidance-counseling tool.

The program is especially useful in recruiting, though, because it is designed to furnish recruiters with the names, addresses, and test scores of high school students who might be interested in military service. The lists the tests yield contain pre-screened prospects, since statistics show that the pool of test takers has more seniors and more males with a higher propensity to enlist than does the high school population as a whole. Additionally, the mental-group distribution of test takers is more favorable than that of the applicants tested at Armed Forces Examining and Entrance Stations.

The program also generates corollary information about what participants plan to do after graduation. Participants indicate which of several categories their plans fall into. The choices are military service, four years of college, two years of college, vocational school, work, and undecided.

Of students who took the test in the 1977–78 school year, roughly 31 percent planned to continue their education at a four-year college, 10 percent at a two-year college, and 7 percent at a vocational-technical school. About 15 percent planned to go to

Figure 2. Of the 1,094,000 juniors and seniors who took the test, 61,153* enlisted. Eight percent of the test takers had indicated an inclination toward military employment.



*This is the number that could be tracked by social security number. Total accessions are estimated at some 100,000.

work upon graduation and more than 30 percent of the test takers were undecided. Those who planned to enter military service constituted only 8 percent of the population (see Figure 2, p. 17).

The test takers' plans give clues as to the various motives for taking the test. Clearly, only a small segment takes the exam because of a decided interest in military service. The large undecided category suggests that many students take the test to help them make up their minds about their goals. This premise is supported by many high school counselors, who regard the ASVAB as particularly informative to average or below-average students with no definite plans. Realistically, were the test not used in civilian counseling, many students with tentative educational or occupational plans would skip the test altogether.

Although the major appeal of the test appears to be its value in civilian counseling, the test, in conjunction with follow-on discussions with recruits, nevertheless helps to stimulate awareness of the military. This fact is confirmed by review of the post-graduation plans of test takers who eventually enlisted. A significant portion of those who indi-

Figure 3. Active-force accession of high-school test takers in 1976-77

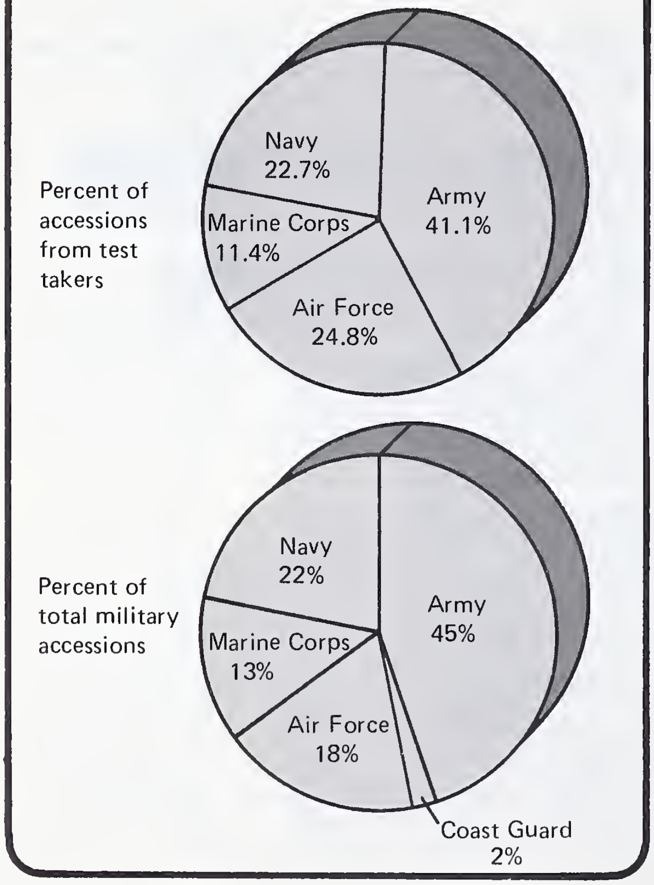
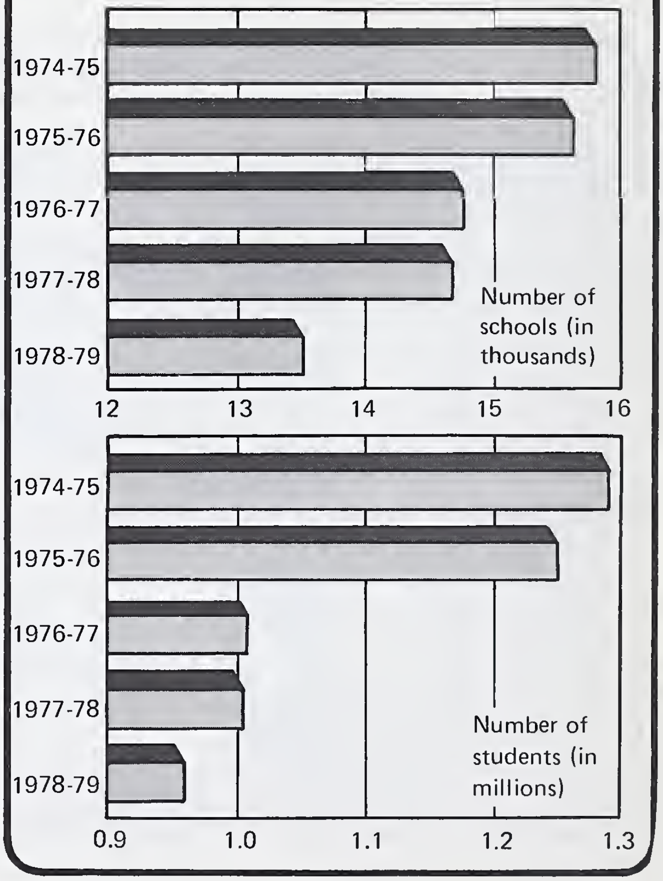


Figure 4. Increasingly fewer students and schools are participating in the high-school testing program



cated that they planned to join the military actually enlisted. Thus, the smallest segment of test takers supplied the largest number of enlistments, over 39 percent of all accessions. Additionally, a significant portion of those who were undecided subsequently enlisted, as did some of those who indicated plans to continue their education or go to work. The second graph in Figure 2 reflects the percentage of accessions from each category.

As of June 1978 about 100,000 accessions were obtained from among students who took the test in the 1976–77 school year. This is not to suggest that the enlistments were due solely to the high school testing program, for even if a student had decided to enter military service before taking the test, the final decision to enlist is influenced by the recruiter as well as other factors. Actually, many of the military-bound students take the high school test in lieu of an applicant test. A survey revealed that about 9 percent of the test participants had already spoken to a recruiter and took the ASVAB at the recruiter's suggestion.

Interestingly, nearly 47 percent of the test takers are female. The services obtain as much as 40 percent of their total female accessions from among those who took the ASVAB in the high school testing program.

Each service benefits from the high school testing program. The percentage distribution of accessions from among high school test takers is roughly proportional to the distribution of total accessions among the services. However, the Air Force's percentage of accessions from high school test takers exceeds its share of total accessions (see Figure 3). This is largely attributable to the graduates' relatively favorable perceptions of the Air Force and to the efficient use that Air Force recruiters make of the prospect lists. Recruiting managers in other services use the lists in conjunction with other sources they regard as equally fruitful, but Air Force recruiting managers are more likely to regard the high school test as central to recruiting operations.

In 1978, the Military Enlistment Processing Command surveyed high school counselors and found that 76 percent were familiar with the testing program and with the test itself; 22 percent were familiar with the test but not with the program; and 2 percent were not familiar with either. Of those familiar with the program, 59 percent rated it either *very good* or *above average;* 32 percent rated it av-

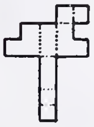
Sample test questions from the Armed Services Vocational Aptitude Battery

1. A coarse acid bread made of unbolted rye is called
   A. Black bread　C. French bread
   B. Pumpernickel　D. Vienna bread

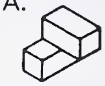
2. Rudiments most nearly means
   A. Basic methods and procedures
   B. Politics
   C. Promotion opportunities
   D. Minute details

3. A car-renting agency charges a fixed rate of $8 per day plus 8 cents per mile. If a family paid the agency $260 for the use of a car on a 2,460-mile trip, how many days was the car used?
   A. 8 days　C. 26 days
   B. 24½ days　D. 32 days

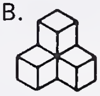
4. If the figure in the first square shown below is folded at the dotted lines, which box would result?



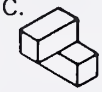
A.



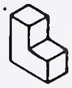
B.



C.



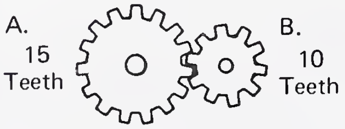
D.



5. A man walks once around a regular hexagonal (six-sided) field. If he starts in the middle of a side and follows the contour of the field, he will make 6
   A. 30° turns　C. 60° turns
   B. 45° turns　D. 120° turns

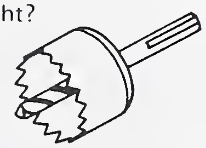
6. Of the non-metallic elements listed below, which one is the best conductor of electricity?
   A. Mica　C. Formica
   B. Carbon　D. Hard rubber

7. If gear A makes 14 revolutions, gear B will make
   A. 21
   B. 17
   C. 14
   D. 9



8. Lack of iodine is often related to which of the following diseases?
   A. Beriberi　B. Scurvy　C. Rickets　D. Goiter

9. What tool is shown at right?
   A. countersink
   B. keyhole saw
   C. hole saw
   D. grinding wheel



10. The generator or alternator of an automobile engine is usually driven by the
   A. Camshaft　C. Fan belt
   B. Flywheel　D. Cranking motor

Answers: 1.B 2.A 3.A 4.D 5.C 6.B 7.A 8.D 9.C. 10.C *erage;* and 9 percent rated it *below average* or *poor.*

For the recruiters, for the services as a whole, for numerous high school students, and for many counselors, the high school testing program serves a verifiable and distinctly useful purpose. Several factors, however, currently mitigate the benefits of the program somewhat.

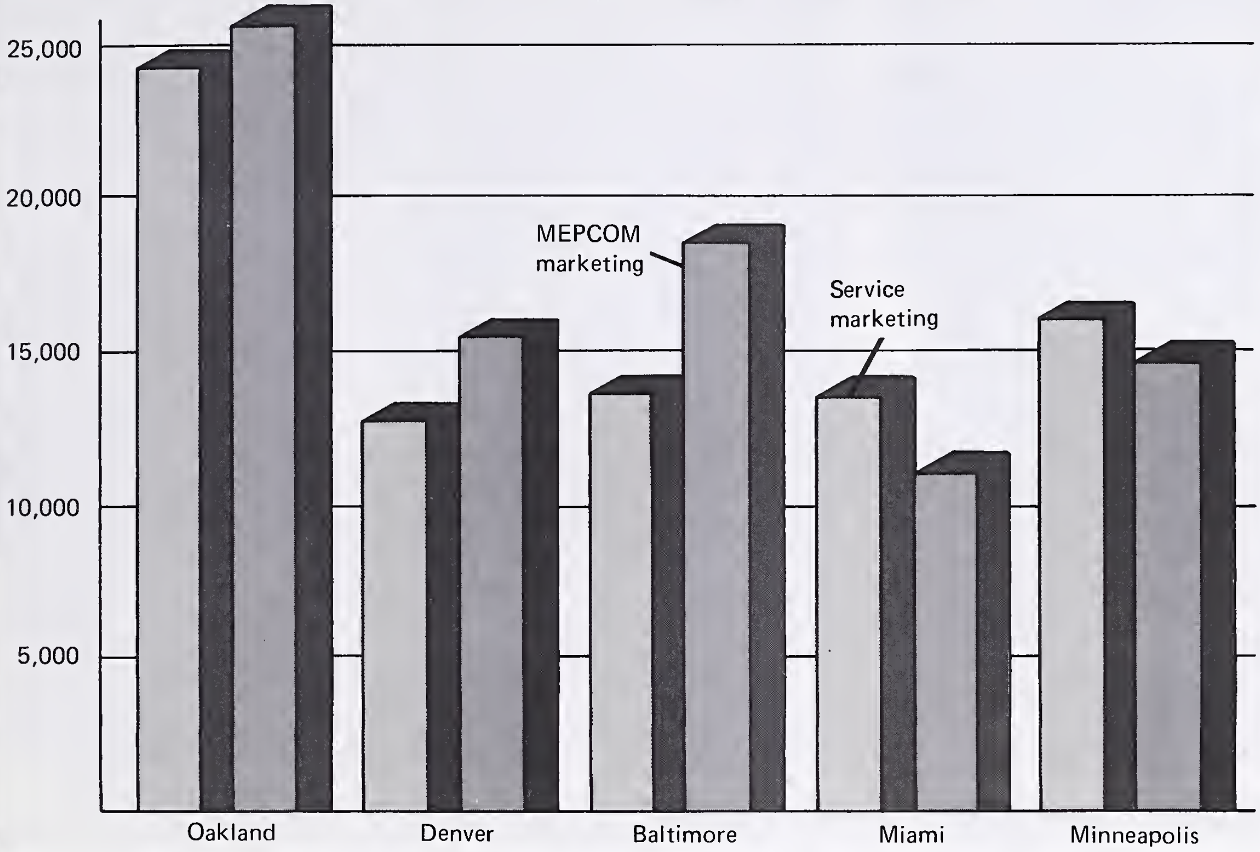
One is the lack of awareness that a majority of parents and students have of the program. Whereas most counselors and school officials surveyed indicated knowledge of the program, only 30 percent of the parents and 28 percent of the students indicated such an awareness. Almost half of the parents and 44 percent of the students were not familiar with the nomenclature ASVAB. One possible reason for the relatively low level of familiarity among parents and students is that only 4 percent of parents and students seriously viewed military service as a post-graduation option.

As revealed in interviews, a second impediment to more widespread use of the test is the tendency of counselors at affluent suburban schools to perceive the test as useful only for those students interested in military service or for those the counselor believes would benefit from military service. In southern states and states with a high proportion of rural schools, on the other hand, counselors are more likely to perceive the test as a useful tool for civilian as well as military counseling. Statistical analysis bears this out. In the 1976–77 school year, about 47 percent of the seniors and juniors who took the test were in southern high schools, which collectively represented only 28 percent of the nation's total high school enrollment. Despite the program's vitality in southern and rural states, though, the number of schools and students participating in the testing program nationwide has been declining since 1975 (see Figure 4, p. 18).

In an effort to reach more schools and students, the Military Enlistment Processing Command and the recruiting commanders experimented in the 1977–78 school year with a new marketing procedure in five test areas selected in part on the basis of their previous low rank in terms of the percentage of available students tested. Under the experimental procedure, MEPCOM representatives rather than the recruiting services contacted some schools on behalf of all services. Formerly each school was assigned to one of the services for marketing. In general, the new method proved successful. Additional schools were tested in all of the experimental Armed Forces Examining and Entrance Station areas, and student participation rose in three of the five test areas (see Figure 5). The year-to-year results are quite favorable when compared with the lowest third of all AFEES areas; only three other AFEES in this group showed year-to-year gains.

Current plans call for MEPCOM to expand its test marketing to five more areas. Still, to increase the number of participating schools and test takers, the Department of Defense must emphasize the test's value as a civilian counseling tool. It must also give greater assistance to counselors in interpreting and applying test scores. With a vigorous three-year effort, the annual number of test takers could again reach the previous peak.

Figure 5. Number of students tested at selected examination stations under service marketing in 1976-77 and under Military Enlistment Processing Command marketing in 1977-78



In fiscal year 1978, the costs readily identifiable and directly attributable to the high school testing program totaled about $4.2 million. The three biggest cost contributors were test materials and research, headquarters staff, and test administration, including the pay of military testers. Analysis shows that each examination costs the government $3.83, a relatively low figure. Exclusive of the freshmen and sophomores who take the test, the cost per lead or favorable prospect is $5.81. In that one of every 7.4 of these leads results in an enlistment, the program is an extremely cost-effective recruiting vehicle compared to advertising and other lead-producing programs.

Naturally, the program has room for improvement. Recruiters could make better use of prospect lists, high school counselors could be made more aware of the program, and the number of program participants could be increased. The initiatives that have been taken, along with the current wave of renewed and well-deserved attention, suggest that the 20-year-old testing program will continue to be important. DMJ

GUS C. LEE, senior research consultant for the Human Resources Research Organization in Alexandria, Virginia, served in numerous manpower positions in the Office of the Secretary of Defense, including Special Assistant for the All Volunteer Force; Director, Manpower Procurement Policy; and Director, Manpower Requirements, Programs, and Utilization. Mr. Lee received a bachelor of law degree and a master's degree in public administration from the University of Texas.

Army basic training for combat-support designated personnel has taken on a new look as women go through the paces side by side with the men. Here, they are acquainted with techniques in the event of a chemical attack; are instructed on field maneuvers and camouflage; and meditate in preparation for rifle-marksmanship testing.

The changing face of Army basic training: more flexible and coeducational

By Managing Editor Thomas J. Gelli

In the last three years, Army basic training for combat-support designees has taken on a new cadence and direction that put it in step with the underlying precepts of the volunteer-force concept. Certainly the two most noticeable changes are the flexibility of the program of instruction and the integration of women and men on the training field. These changes have shaped an approach to basic training that at first played to mixed reviews but now is steadily gaining acceptance. However, while most of the recruits and officers at basic training sites have given the approach a firm endorsement, noncommissioned officers, particularly drill sergeants and training instructors, have been somewhat more reserved in their appraisals.

Although the basic training program of instruction for combat-support personnel is less demanding than it was four years ago, today's basic training graduate is generally held to be just as suitably trained and disciplined as was his predecessor who went through a more rigid, sexually segregated basic training program. That view, however, is not universally shared by drill sergeants, some of whom contend that the laxer atmosphere and the presence of women have severely reduced the physical rigors and the general effectiveness of basic training.

Today, a combat-support designee in basic training meets the Training and Doctrine Command's minimum fitness standards if he or she can do 22 push-ups and 28 sit-ups, and can traverse a flat mile in less than 10 minutes. It should be noted, however, that each training site may establish its own, higher standards. For example, at Fort Jackson, South Carolina, male recruits must do 31 push-ups and 31 sit-ups, and traverse 1.5 miles in 12 minutes, 24 seconds. Bearing witness to the new flexibility is the fact that a soldier is sometimes allowed to substitute a more personally negotiable calisthenic exer-

Photos by Larry J. Wilson

Training sergeants are with the new soldiers from lights on to lights out. While their methods are perceived as less harsh than they once were, the sergeants remain ever willing to give individualized attention to any soldier who may need it. Before moving to the firing range, recruits are instructed in the care and handling of their weapons.

cise for one he or she cannot satisfactorily perform. Failure to meet these physical training baseline criteria does not in itself bar a soldier from moving on to advanced individual training.

On the other hand, basic training is neither designed nor intended to produce seasoned, fully ready personnel. In it, the individual simply learns the rudiments of soldiering. Special job skills and general proficiencies are acquired during advanced individual training and after assignment to a unit.

The recent changes in the basic training environment clearly reflect the Army's philosophy of modernization in this era of the all-volunteer force. The stereotype of the drill sergeant as a hard-driving, overbearing martinet is truly an anachronism. In fact, as a result of policy changes spawned by the Committee of Nine—a board composed of commanders from Army training installations—the term *drill sergeant* is now taboo in direct address, having been replaced by *sergeant*. Furthermore, the term *trainee* officially has given way to *soldier*. Profanity of any kind has also been scrubbed from the basic training environment. Such reforms, while nettling the more traditional-minded members of the training cadre, do reflect the Army's new bent toward treating today's volunteer soldier with respect and consideration. This is clearly evident at the reception center, where the arriving recruits are actually given a choice of Army-regulation haircut styles and go about their business without duress or harrassment.

Upon arrival at the reception station, the new soldier is given a partial paycheck, the men receiving $75; the women, $145. With this money, the new soldiers must purchase personal accessories and toiletries. The extra money received by the women is for the purchase of women's undergarments, which are not issued. After the necessary purchases are made, recruits have $50–80 to pocket.

Although opinions may differ as to the efficacy of this new approach to basic training, it is generally agreed that today's incoming volunteer is a breed apart from his drafted predecessor, who had to satisfy stiffer entrance requirements. Whereas only several years ago, a prospective soldier had to have completed the tenth grade and passed the Armed Forces Qualifications Test, today he or she need only pass the qualifications test to be eligible for enlistment. Up until last year, women had to have a high school diploma or GED equivalent to enlist. No longer is that true.

An observation voiced by staff members up and down the command chain is that today's incoming volunteers are wanting in discipline and unaccustomed to answering to an authority figure. Invariably, concerned cadre point an accusing finger at an indulgent society and a permissive home and school environment as major causes of the eroded discipline. Interestingly, however, a considerable number of new soldiers claim they like the stricter discipline they are receiving and that the basic training environment is not as spartan and onerous as they had imagined.

For many recruits, some having joined the Army simply to escape an unpleasant environment at home, basic training is their first extended time away from home. Naturally, attrition during basic training is to be expected, and statistics indicate it is higher now than it was in the days of the draft. Such a comparison, however, is misleading since the Army is far less tolerant of the volunteer than it was of the draftee. Under the draft, permitting soldiers to separate during basic training without penalty or stigma would have undermined the purpose of conscription, since it would open an exit door for those not wanting to be in the Army to begin with. With few exceptions, the volunteer soldier is in the Army of his or her own volition. And although roughly 10 percent of today's volunteers attrite during basic training, many do so with the Army's blessing. In fact, as soon after induction as possible, the Army attempts to identify those individuals who are unlikely to succeed. If attempts at counseling and rehabilitation prove fruitless, the individual is expeditiously discharged.

At Fort Jackson, soldiers with major attitudinal and sociological problems are removed from their

(continued on page 28)

First Sergeant Albert Lawson: *"Just another challenge"*

SERGEANT ALBERT LAWSON is first sergeant of a basic training company at Fort Jackson, South Carolina. For more than half of his 20-year Army career, he has been closely associated with the training of new soldiers. Here he comments on the changes he has witnessed in the basic training program and in the kinds of individuals now entering the Army.

DMJ. Have you seen a significant change in the nature of basic training since introduction of the all-volunteer force?
Lawson. No, I wouldn't say it's been a significant change, although there obviously have been some modifications. Certainly, the drill sergeants, if you'll excuse the term, are not as overbearing and demeaning as they once were. This is not to say that today's basic training graduate is any less disciplined than his forerunners of a decade ago, although he may be less physically fit. Of course, these are combat-support troops we're talking about. I just returned from Fort Benning, Georgia, where they train combat soldiers, and I can tell you that those people are highly motivated and physically fit. But I don't think the less-stringent atmosphere for combat-support personnel is detracting from the Army's combat readiness.

DMJ. You say that today's basic training graduates may not be as physically fit as they were several years ago. Why is that?
Lawson. There are several reasons. For one thing, the physical training baseline criteria have been lowered, and now an individual can graduate from basic if he or she can do a couple dozen sit-ups, push-ups, what have you. The standards are definitely not too tough. Also, many of the volunteers arrive in terrible physical condition. For many, that first half a lap around the track is more than they can deal with. And the food is so plentiful and excellent, it really is, that some even gain weight while they're here.

DMJ. How does the volunteer soldier differ from the draft soldier?
Lawson. From what I've seen, I'd say the average volunteer doesn't have as much formal education as the draftee. During the draft we had more college graduates go through basic. Now, we still get a few but they're rare. The volunteers, however, seem to have a better attitude and show a greater willingness to become good soldiers. I will say that the volunteers seem to lack the discipline the draftees had. I know this sounds incongruous with what I just said about attitude, but it's true. Answering to an authority figure is a totally foreign thing to some of them. Some of the volunteer soldiers tell me they joined the Army because they wanted discipline. We try to give it to them. You know, it isn't easy doing in six weeks and four days what parents and teachers didn't do in 18 or 19 years.

DMJ. Do many volunteers have trouble adjusting to military life?
Lawson. Sure, some do and we expect that. In my unit, I review the enlistment papers and personal credentials of every incoming soldier to identify the ones that are most likely to have trouble. Usually, misspelled hometowns and parents' names alert us that the individual may have some difficulty with the language. You often find that nearly half of an incoming company come from broken homes. We do have a special adjustment unit for those with serious attitudinal or sociological problems. If a stint in the adjustment unit doesn't remedy things, then a discharge is granted.

In my opinion, we're too generous with discharges. Recruiters may be telling these individuals that they can simply get an honorable discharge if things don't work out. Consequently, many sign up and then fold. I don't think the first few weeks in the Army should be a trial run.

DMJ. ***To change the subject somewhat, how about the social problems that inevitably arise when adult men and women work and live so close together?***
Lawson. For one thing, I know that many of the drill sergeants' wives aren't too fond of their husbands being with women soldiers from lights on to lights out. Fraternization between members of the training staff and soldiers is extremely rare, but when it does happen, it's dealt with severely. I suspect there are some outside social activities that go on between the recruits, but we don't see much of it. Actually, there's not much time during basic training for leisurely pursuits.

DMJ. How has coeducational basic training affected the male sergeants and training instructors?
Lawson. At first it had a very noticeable adverse effect. As you probably know, drill sergeants are very proud of their specialty. When the women arrived in 1977 and when the Committee of Nine issued new restrictions, many felt their thunder had been taken away from them. Their pride was hurt and many threatened to leave the Army. After a couple years now, I think most have gotten used to the idea of training women, although I wouldn't say they're all that happy about it. But drill sergeants aren't ones to complain and I think it's safe to say that most of them view the presence of women here as just another challenge. The Army has changed, and the drill sergeants and instructors realize they must change too.

Major General Mary E. Clarke:

MAJOR GENERAL MARY E. CLARKE is the commanding officer of Fort McClellan, Alabama, one of four coeducational basic training sites in this country. She is the former director of the now disestablished Women's Army Corps.

DMJ. According to some sergeants and training instructors, the guidelines handed down by General Starry and the Committee of Nine are cramping their style. They claim that, as a consequence, the quality of today's basic training graduate may not be quite what it was in the past. How much validity do you feel there is to such claims?
Clarke. Not much at all. Here at Fort McClellan, we will not graduate anyone we would not want to serve with. Becoming a soldier is not automatic. It takes time and hard work. Some of the incoming soldiers do have some problems with the language. Many have reading deficiencies. This simply requires us to work a little harder to turn them into responsible soldiers. Remember also that many of the outspoken young sergeants didn't work with the recruits of a decade ago, so their comparisons may be a little dubious.

DMJ. How does today's volunteer compare to the incoming soldier of 20 or 30 years ago?
Clarke. I was in World War II, and we always thought we were the best. Seriously, though, soldiers of World War II and the Korean conflict came from a different society, with a different set of values. I guess you could say they were more disciplined when they arrived at boot camp. They were more accustomed to taking orders and to working long hours. Young people today do not have the same sense of responsibility as did their predecessors of 20 or 30 years ago. Many view affluence and leisure as the norm. Certainly, comparisons are difficult to make. Keep in mind, though, that today's soldiers are true volunteers. It is the Army's responsibility to give them the best training and leadership possible.

DMJ. Are today's volunteers getting enough responsible training to make them a ready military force?
Clarke. Definitely. In light of the short time (6½ weeks) they are here, the basic training program of instruction provides them the best foundation possible. Keep in mind that their training doesn't cease with basic training. Their job skills and physical abilities are further developed at advanced individual training and at their assigned units. The Army's emphasis on physical conditioning is as great today as it has ever been.

DMJ. As entrance requirements become less restrictive, will the Army be a melting pot for individuals who lack skills to make it in civilian life?
Clarke. I don't foresee the Army becoming a catch-all for underachievers, if that's what you mean. Certainly, more people will be applying for enlistment, so recruiters and Army management must let it be known far and wide that it is not a soft life in the Army. Quite frankly, I have no objection to a young man or woman joining the Army to earn a living and learn a skill. All young Americans should have an equal opportunity to serve their country. Of course, if an individual turns out to be a poor soldier, he or she can and should be separated. This again is leadership's responsibility.

DMJ. With equal standards and treatment for

"Treat a soldier like a soldier"

In that her distinguished Army career bridges five decades, General Clarke sits in somewhat of a catbird seat. The following interview displays her considered judgments on the responsibilities of leadership and the worth of the all-volunteer soldier.

men and women during basic, do you foresee any major changes to the program of instruction for basic training?
Clarke. Radical changes, no. However, we are constantly seeking ways in which to improve training. Presently, basic training is designed to instill discipline and teach the young soldier military courtesy. It provides all soldiers with the same basic military skills and foundation. It's doing that, and there's really no reason to depart from a program that has proven successful.

DMJ. Some critics and traditionalists contend that discipline and courtesy could be instilled better under sexually segregated conditions.
Clarke. Such attitudes are unfortunate. You know, many of the skeptics did not serve with women in the Second World War. Women then did many of the same things our women are doing today. Let me emphasize that not one woman finishes basic training who isn't just as well qualified for military service as a man. We must never regress to sexually segregated basic training. It's taken us seven years to really get it rolling. Men and women soldiers will work side by side in their assigned units. It's only logical to get them accustomed to working with each other as soon as possible.

DMJ. If the United States found itself actively involved in a military conflict which created a sudden need for trained and ready personnel, would coeducational basic training continue?
Clarke. Absolutely. For one thing, there's as great a need for women in combat-support roles as there is for men. And for another, the length of time it takes to effectively train a man during basic is in no way increased by the presence of women.

DMJ. One complaint often heard on the training field is that men and women aren't always treated exactly in the same fashion. Is there any substance to that?
Clarke. Yes, perhaps, but only to a small degree. Once again, that sort of thing is leadership's fault. Today's sergeants and instructors are better and more suitably trained than ever. However, some of the male sergeants may still be a bit unsure about how to treat the women soldiers. I think that's to be expected. It's just a matter of treating a soldier like a soldier. In time, these problems will disappear. Look at the progress made in this area just since 1972.

DMJ. What do you see ahead for women in the military?
Clarke. I see good things ahead, but again, it's going to take a while. Unfortunately, there aren't many senior women in top leadership positions, because until 1968 there were strict restrictions on women's promotions. Although I don't keep up strictly with women's matters, I think there are roughly 20 women colonels and two generals now. Certainly, as the young women come up—and the Army has some really, really outstanding women officers coming up—there will be many more women placed in policy-making positions. It's down the pike, but as long as the women hang in there, their future in the military looks very bright.

Included in the program of instruction are various field exercises, including some with live ammunition. In this sequence, a recruit uses the brush and battle-scarred terrain for cover as she and a fellow recruit team to stalk an enemy machine-gun nest. A training instructor carefully observes her actions and grades her performance.

assigned unit and placed in a military adjustment unit. Such a program combats unnecessary attrition and promotes the retention of individuals experiencing temporary adjustment problems. Of the more than 2,500 soldiers having gone through Fort Jackson's adjustment program since its inception in 1978, nearly 60 percent have gone on to complete advanced individual training. Program statistics show that the ratio of men to women placed in the adjustment unit is pretty much equal to the ratio of men to women going through training at the installation.

With the integration of men and women at basic training and the edicts issued by the Committee of Nine, training sergeants have had to exercise new tact and technique. Sergeants of both sexes note that the men and women have different psyches and temperaments, making the blanket application of disciplinary and motivational techniques ineffective and imprudent. Some sergeants and instructors admit a reluctance to reprimand a woman in front of a man and vice versa. Others readily admit a tendency to be less demanding on the women, which in turn tends to soften their treatment of the men.

But such kinks are really problems in the implementation of the coeducational approach rather than in its theory, which calls for identical treatment and standards for all soldiers. Many of the sergeants and training instructors who grouse about the coeducational approach also confess that for one reason or another they have been negligent in following the very precepts they claim are not working, which of course can create a self-fulfilling prophecy. Moreover, some observers suggest that the jaundiced eye through which some noncommissioned officers are viewing the coeducational aspect of basic training may be distorting their perception of how operative it really is. Proponents contend that the integrated approach is working out quite

Despite new flexibility in the physical requirements, crutches and casts are not unusual sights at training installations. Wearing boots designed primarily for a male's wider foot, some women are susceptible to foot injuries and are allowed to wear tennis shoes. The Army is now developing a boot specifically designed for women.

well and that the biggest stumbling block to unqualified success is simply the refractoriness of traditional-minded sergeants and instructors. Simply put, it may just be a matter of acceptance—acceptance which will increase as natural turnover occurs in the training cadre.

Oblivious to any tempest that may be surrounding the issues of flexible and coeducational basic training, the volunteers, for the most part, find the new approach to their liking. Most find the training agreeable, the treatment fair, and the program of instruction generally effective. Additionally, the coeducational environment has fostered a healthy competitive spirit as the men and women strive to match or eclipse the performance of their counterparts of the opposite sex.

Despite some initial apprehension, most of the men grow accustomed to and like having the feminine company. Personal relationships between the men and women are seldom allowed to go beyond the platonic, although a small amount of dalliance is inevitable. Fraternization between male cadre and women recruits is forbidden and results in stringent disciplinary action against both. The barracks, of course, are sexually segregated.

Although much of the clamor over this contemporary approach to basic training for combat-support personnel has greatly subsided, there remain those who suggest that only through a real conflict can the concept's success be credibly measured and validated. There is no denying that the basic training program of instruction at the combat-support training sites is less demanding than it once was. Nonetheless, the program appears to provide an appropriate and sturdy foundation upon which the individual can develop and refine his military occupational skills. Succeeding at this, flexible and sexually integrated basic training for combat-support designees is indeed shedding its novelty and marching toward acceptance. DMJ

•The Navy's enlisted manpower budget is about $4 billion a year. Turnover is high, and there are rapid changes in pay and in force structure. A 1-percent miscalculation in computer projections can easily result in a $40-million error. Your job is to estimate the Navy's payroll costs for the next three years within a tenth of a percent.

•Civilian personnel costs are skyrocketing. Many hours of overtime are being logged, yet a work backlog remains. Your job is to increase productivity and reduce the need for overtime.

•The Naval Academy, a major source of commissioned officers, is experiencing a high dropout rate. One out of three midshipmen is disenrolling before graduation. Navy planners believe that at least 80 percent of its academy-trained officers should have engineering and technical backgrounds. Your job is to find a way to reduce this attrition rate and fill the academy's ranks with individuals possessing an aptitude for science and mathematics.

Each of the three tasks cited above was actually faced by Navy managers, and each was undertaken by researchers at the Navy Personnel Research and Development Center.

The center was established in San Diego, California, in 1973 upon the merger of the Naval Personnel Research and Development Laboratory, Washington, D.C., with the Naval Personnel and Training Research Laboratory, San Diego. The center is the Navy's principal activity for conducting and coordinating human resources research, development, testing, and evaluation. One of eight laboratories directed by the Chief of Naval Material, it is chartered to provide support and services to the systems commands and to the other seven laboratories as necessary to ensure proper consideration of human factors in the development of operational systems. In addition to its facility in San Diego, the center operates offices in Pensacola, Florida, and in Washington, D.C.

Most of the center's 250-member staff are professionals skilled in disciplines germane to manpower and personnel problems. More than 90 percent of its professional staff have graduate degrees, primarily in the fields of psychology, education, mathematics, statistics, and operations research. Also assigned to the center are 23 line officers and rated enlisted personnel with extensive fleet experience.

In conducting people-related research and development, the center regards Navy personnel as a system whose various components of selection, training, and performance are studied as integral, interactive parts. Such an approach results in well-planned, timely, and relevant research and development that will help forge an effective naval force over the next decade.

Since its inception, the Navy Personnel Research and Development Center has made a significant contribution to personnel management and training. The examples at the beginning of this article represent cases in point.

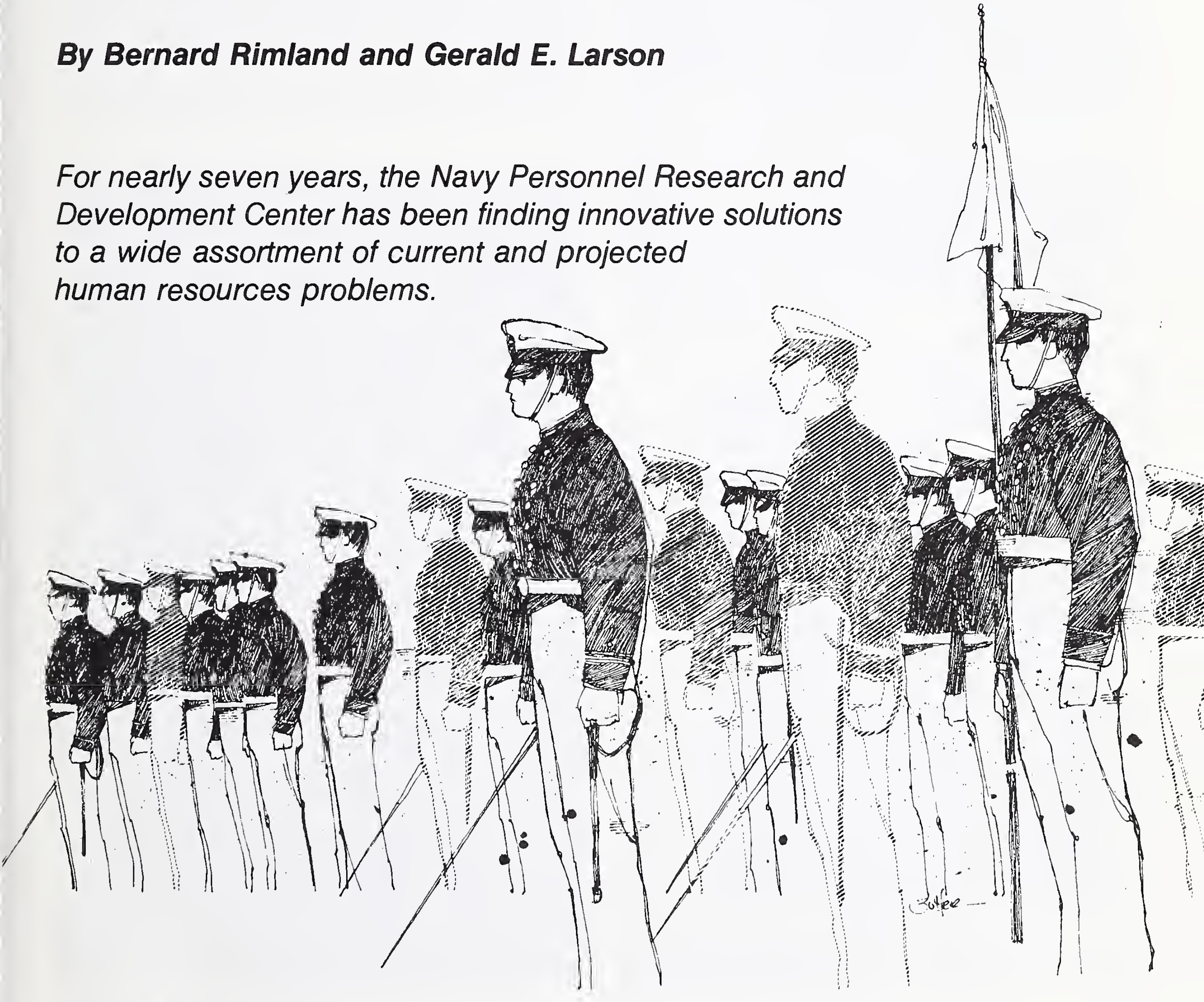
The manpower and budget forecasting problem required the development of a computer model of the personnel system. The model, titled Naval Personnel Pay Predictor, Enlisted, takes into account the age, length of service, and other personnel demographic information. Over a three-year lead time, the model's estimates have produced a very small percentage of error (see Figure 1, p. 32).

The productivity-enhancement project called for creation of a performance-contingent monetary incentive system for civilian employees. The system was tested on employees in the keypunch section of a data processing department at the Long Beach Navy Shipyard. During the test period, the daily work backlog and average weekly overtime hours dropped to nearly zero. The average key-strike rate increased from approximately 8,500 to 10,700 per hour, or about a 17-percent increase in productivity (see Figure 2, p. 33). Future efforts in this area will include the development of incentive systems for

Confronting the Navy's manpower dilemma

By Bernard Rimland and Gerald E. Larson

For nearly seven years, the Navy Personnel Research and Development Center has been finding innovative solutions to a wide assortment of current and projected human resources problems.



various jobs at other naval installations as well as the use of non-monetary awards.

The problem of high attrition and the need for engineering, science, and mathematics students at the Naval Academy was greatly ameliorated by incorporating the widely used counseling tool, the Strong Vocational Interest Blank, into the applicant-selection procedures. The interest blank helps officials identify those applicants most likely to select an engineering or science major. Since the inclusion of the interest blank in the selection process, the percentage of science and engineering majors has increased from 62 percent in 1977 to 80 percent in the classes of 1978 through 1981.

The creation of an additional key for the blank, the Combined Disenrollment Scale, has helped reduce the academy's attrition rate. The disenrollment scale helped officials identify those applicants most likely to drop out. Figure 3 shows the disenrollment rates after the introduction of the scale.

The Navy Personnel Research and Development Center is organized around nine research and development programs, each embracing several research topics. At least one research group, and often two, addresses the four product areas of—

- Personnel acquisition, utilization, and effectiveness
- Human performance in Navy systems
- Personnel education and training
- Personnel and manpower management

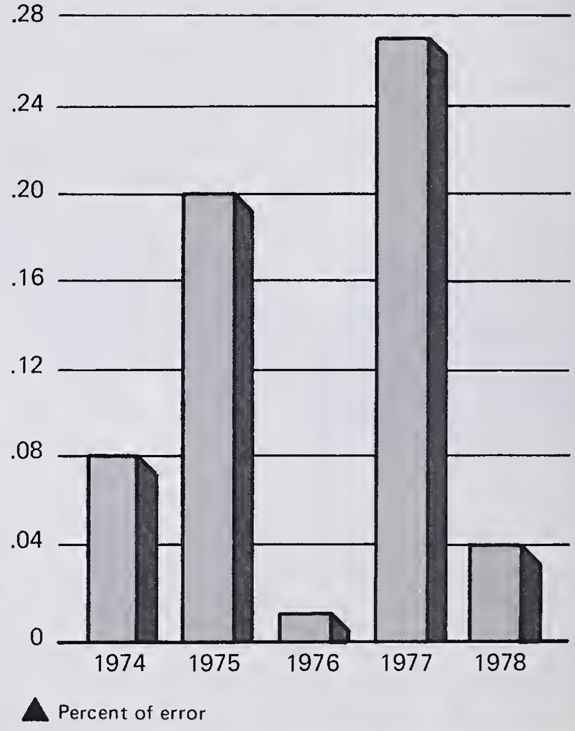
Recent accomplishments include the development of a computer-based counseling system to acquaint high school students with those military and civilian occupations in the Navy that are compatible with their educational plans, occupational interests, and vocational aptitude. This counseling system can be used in conjunction with individualized testing via a computer terminal that provides a better and more comprehensive person-job match. Additionally, new methods of preenlistment screening are being explored in an attempt to stem first-term discharges.

A computer model, SHIP II, which simulates the operational performance of the crew and equipment aboard ships with up to 400 personnel is another product of the center. This computer simulation provides a fast, cost-effective capability for solving ship-related problems without the necessity of experimenting aboard operational fleet units. SHIP II has proven valuable in testing manpower requirements on destroyers, in formulating work-load-reduction recommendations for missile ships, and in testing new maintenance personnel staffing policies and procedures for fast frigates. Also, it will be used to aid in the engineering design of ships, to help minimize their manpower costs.

In the training domain, the center's researchers have applied advanced technology such as audio-visual programs and computer-aided instruction to aid in training crewmen for the S-3A, a carrier-based anti-submarine warfare aircraft. Many of the new procedures led to reduced training costs. For example, computer-based training replaced the costlier simulator training, which had replaced the even costlier in-flight training.

Recently, researchers at the center developed an Instructional Quality Inventory which provides quality-control procedures for designing training programs. The inventory facilitates evaluation of existing instructional materials and new contractor-

Figure 1. Because a 1-percent error in forecasting Navy manpower costs 3 years into the future can mean a $40-million budget discrepancy, NPRDC researchers were tasked with developing a predictive computer model. Since 1974, this model has never been off by more than 0.27 percent.



developed products. In ensures the adequacy of learning objectives and the credibility of tests given during the course.

The research and development work done at the center for the Marine Corps has significantly improved the Map Interpretation and Terrain Analysis Course. Addressing flight navigation problems unique to the Marine Corps, the course bolsters the low-level flight capability of helicopter assault teams. The course includes a 14-hour block of flight training and is being procured for all Marine rotary-wing air groups.

The center's contributions to personnel selection, training, and management have resulted in considerable savings in both money and manpower. Of course, there remain more than enough problems to challenge the resourcefulness of even the most able researchers.

Of major interest to researchers here is the manpower pool from which personnel will be drawn in the next two decades. The projected decline in the size of the pool is hardly arguable, since the men and women who will be 17 to 21 years old in 1995 have already been born. The available data point toward a 28-percent decline in the primary military manpower supply pool (males 17–21 years old) until 1993, when an upward trend is projected to begin. This has serious implications for the Department of Defense, for unless present personnel requirements are lowered, it will have to enlist 25–30 percent of the qualified members of the pool of 18-year-old males by 1985.

While the sharp decline in the size of the future pool cannot be questioned, there has been a good deal of controversy regarding a possible decline in the quality of the individuals who will compose it. The increasing sophistication of the equipment, coupled with the apparent decline in the skills of the

Figure 2. As a result of a performance-contingent monetary incentive system developed by NPRDC, productivity among civil servants in a data-processing department at the Long Beach Navy Shipyard increased by nearly 17 percent.

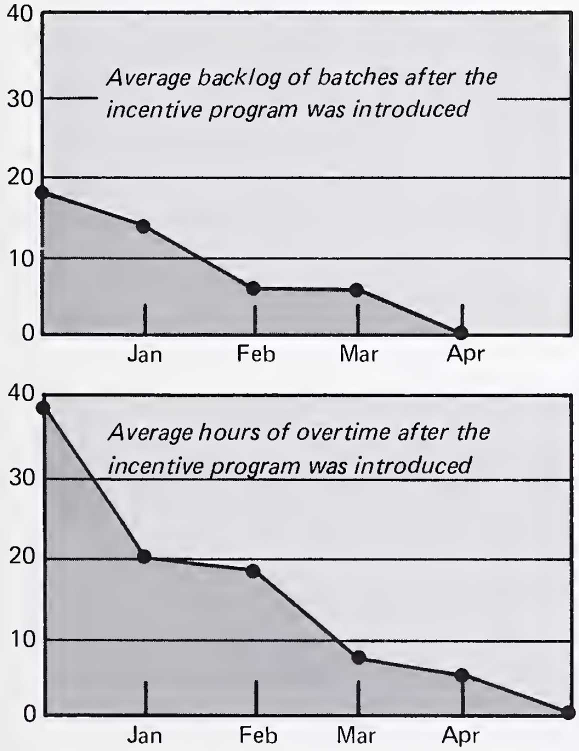
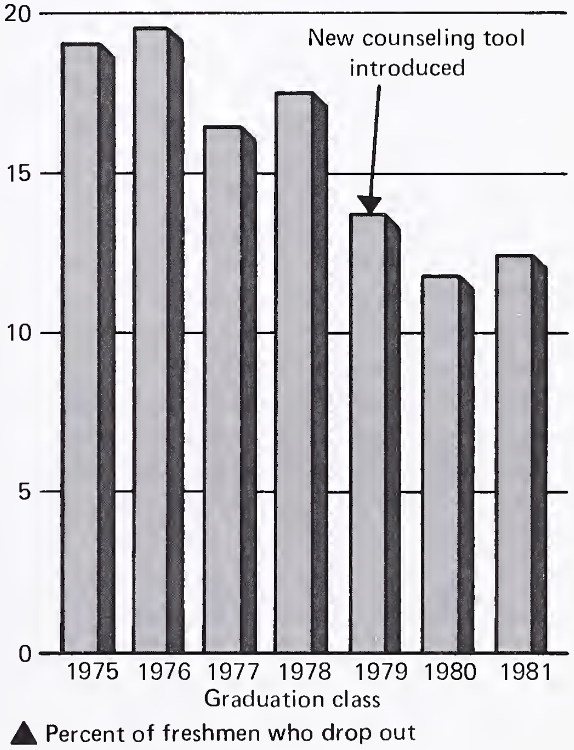


Figure 3. An alarmingly high attrition rate at the U. S. Naval Academy was reduced through the introduction of an NPRDC vocational counseling tool that enables the Academy to predict more accurately which applicants are likely to drop out



incoming recruits, creates much concern. Project JOBS (Job-Oriented Basic Skills) represents one attempt to deal with this problem. In this project many recruits whose low scores on Navy entrance tests preclude them from technical training voluntarily enter a remedial program in which training efforts focus on the particular skills required for the rating or job that best fits their abilities.

The Navy plans to offer JOBS training as a performance incentive during the first year of service, and officials believe that the first-term attrition rate will thereby be reduced. Project JOBS is funded primarily by the Navy, with supporting funds for curriculum development provided by the Department of Education, which is acutely interested in vocational training programs.

Through its psychobiology research project, the center is using a somewhat different tack to make maximum use of the limited manpower pool. The goal of this project is the development of alternatives or additions to the traditional paper and pencil aptitude tests. While paper and pencil tests may effectively predict how well an individual will do in an academic or classroom setting, they do not effectively predict an individual's performance in real-life situations. The psychobiology research project team is developing and evaluating highly advanced computer-based methods of measuring individual differences by recording and analyzing electrical brain signals that are picked up by small scalp electrodes. The technology used in analysis of *cortical-evoked potentials* has already been applied to aviators, anti-submarine warfare trainees, and recruits in remedial reading. It is intended to tap those abilities and aptitudes not uncovered by conventional tests.

Human-factors engineering is yet another approach to correcting the wide discrepancy between the demands of sophisticated equipment and the limitations of the individuals who operate and maintain the equipment. In the past, equipment was designed by engineers who assumed that the men who would operate and maintain it would be only a trifle less qualified to do so than they. Such assumptions led to frustration for all concerned. Today, Navy Personnel Research and Development Center human-factor specialists are brought into the new-system cycle very early, when it is the most feasible to incorporate human-factors considerations in the system design.

Researchers at the center are not concerned solely with short-term problems. As scientists, they must be alert to future problems and be vigilant for solutions to emerging problems. High-priority problem areas targeted for expanded research and development efforts include manpower costs as they relate to weapons systems, civilian personnel development and performance appraisal, productivity, human factors in command and control, and individualized computer testing of personnel.

Research will also focus on the still poorly formulated problem of trade-off technology. As dollars, manpower, and other resources grow scarcer, managers must make difficult choices that seem to defy rational analysis because there are no methods of quantifying the costs and consequences of alternative decisions. Questions arise as to what proportion of each dollar should be spent in recruiting, selection, and training; and on new systems as opposed to the improvement of old systems. Thousands of decisions of this nature are made daily at many levels. And while the effectiveness of the Navy hinges upon the quality of those decisions, little is known about the decision-making process or about ways to improve it. The Navy Personnel Research and Development Center is working to change that.

There can be little doubt that the Navy will continue to face a number of intricate and complex human resources problems. It is clear that the demand for effective recruitment and utilization of manpower is growing with each new year. Indeed, the shrinking manpower pool and the increasing sophistication of new equipment give added importance to the center's mission and portend unprecedented challenges for its researchers in this new decade. DMJ

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Improving aircraft navigation through shared technology

By Burrell W. Hays

The application of ring laser gyros led to a valuable breakthrough in aircraft navigation technology.

The idea that two heads are better than one is by no means new, but scientists in the nation's research laboratories are applying this old platitude in novel ways. When researchers in military labs team up with their colleagues in civilian firms, the resulting transfer of information often leads to scientific creativity and technological innovation.

One prime example of the kind of technological advancement that can result from collaborative effort is a new aircraft navigation system that uses laser beams. This sophisticated yet amazingly simple direction-sensing method was developed when scientists at the Naval Weapons Center in China Lake, California, cooperated with scientists at Honeywell, Inc. The outcome was of mutual benefit, for the Navy now has a missile guidance system far superior to its predecessor, and Honeywell has won a $100-million contract from the Boeing Company to install similar systems on new aircraft.

Since being founded in World War II as the Naval Ordnance Test Station, the Naval Weapons Center at China Lake has innovatively advanced weapon and related technologies, of which many have civilian applications. The Naval Weapons Center's supportive management philosophy stimulates its scientists and engineers to explore new approaches in meeting the Navy's material needs. Staffed by experts in many fields, the center is responsible for all phases of product development, from conception to design. Work at the center ranges from basic and applied research through exploratory and engineering development to contract management. Government and private sector organizations are encouraged to collaborate at each stage of development. In the case of the inertial guidance technology, the center and Honeywell worked together closely. First, Honeywell developed the basic component of the system, a ring laser gyro; next, the Navy built the first functional navigation system; then the two organizations shared information to find applications for the new technology.

The Navy's interest in the ring laser gyro goes back to the mid-1950s, when the Navy wanted to use an inertial guidance system on the Marlin, a subsurface-launched weapon. At that time, however, neither computer nor gyro technology could produce a system with adequate reliability and capability. Consequently, when the Sperry Corporation in 1962 invented a laser gyro, Navy engineers were interested in such new technology.

A laser gyro uses mirrors or prisms to reflect two laser beams in opposite directions in an enclosed area to produce a ring configuration. When an angular rotation is impressed about an axis normal to the lasing plane, the frequencies of the two beams shift, one increasing in frequency and the other decreasing. This frequency difference is proportional to the input angular rate. In the original ring laser gyro developed by Honeywell, the lasing medium was contained within a quartz block, the parts of which were joined with epoxy seals. Honeywell combined three ring laser gyros so that they would note changes in three directions; this triad of ring laser gyros is now the heart of the direction-sensing system of the Navy's Advanced Tactical Inertial Guidance System (ATIGS) and Honeywell's inertial reference system.

The first triad of ring laser gyros delivered to the Naval Weapons Center in 1965 was considered to be a means to stabilize missile launchers for shipboard weapon firing. However, the ring laser gyro feasibility tests uncovered several deficiencies. The quartz block was too easily permeated by the helium from the lasing medium, the epoxy seals joining the blocks were inadequate, and the system was insensitive to small changes in the attitude of its mounting platform, and thus was too easily "locked in."

The ring laser gyro had obvious shortcomings, but scientists and engineers at the center were intrigued by the new technology's potential application to inertial guidance. In the decade following their first ring laser gyro tests, scientists at China Lake experimented with more than 30 developmental ring laser gyro models built by Honeywell, Sperry, and other companies.

Although the study of lasers and mirrors by the Naval Weapons Center aided later ring laser gyro developments, the early work centered on the engineering applications of the ring laser gyro and on the design of a system that was both inexpensive and reliable. In particular, Naval Weapons Center personnel studied the characteristics of the different kinds of ring laser gyros to gain broader knowledge of the strengths and weaknesses of each type.

Soon the Naval Weapons Center considered using this laser gyro as a sensor in midcourse guidance systems for medium- and long-range guided missiles. The laser gyro had distinct advantages over the conventional gyro. These included:

- *Suitability for strapdown mechanization.* The inertial component is directly attached to the platform without the use of gimbals (supports). A computer receives the gyro information, uses it to resolve the acceleration sensed along the carrier axes, and refers this information to the inertial frame of reference. The absence of moving parts makes a strapdown system less likely to breakdown than a gimbaled system.
- *Ability to withstand high g forces.* A rapid change in speed and direction does not degrade laser performance in the way that a spinning gyro is affected.
- *Long shelf life without needing recalibration.* Other systems built with moving parts need recalibration if they are not used for some time; the ring laser gyro maintains its calibration.
- *Comparatively low cost for the amount of reliability attained.* The ring laser gyro in a block can be readily produced in quantity.

Midcourse guidance of missiles is often considerably less precise than aircraft guidance and navigation, since the flight of a missile—especially of a short- or medium-range missile—is of relatively brief duration. But even in its primitive stages the ring laser gyro promised to enhance the Navy's missile guidance systems by affording the degree of accuracy needed for brief midcourse guidance.

In the late 1960s engineers at the Naval Weapons Center began construction of a breadboard model of a navigational system that used ring laser gyros. At that time, such a model was limited by ring laser gyro technology and by the state of the art of computers. A miniature computer capable of solving in-flight problems was as vital as a more stable ring laser gyro. Anticipating a breakthrough in hardware, the Naval Weapons Center engineers analyzed the essential calculations in advance, so that, when a suitable high-speed miniature computer was developed, the system for solving the in-flight equations stood ready.

By the early 1970s, Honeywell engineers had made major improvements to their ring laser gyro. Cer-Vit, a ceramic material relatively impermeable to helium, replaced quartz in the block. Its rugged block provided an extremely stable mirror mount and a high-quality gas container. Contact seals, a major improvement over the old epoxy seals, joined the block of the ring laser gyro and offered ultrahigh vacuum integrity. Mechanical dithering—back-and-forth motion of the laser block so rapid that it cannot be detected by the human eye—became one of the most promising methods for overcoming the laser gyro's tendency to lock in.

Computer miniaturization and speed had also advanced. Naval Weapons Center engineers used Honeywell's ring laser gyro triad, accelerometers, and a computer to draw benchmark specifications for a strapdown navigational system that would be attached to the missile frame, rather than gimbaled as were earlier, mechanized systems. This new system was christened the Advanced Tactical Inertial Guidance System. The contract to build the system went to Honeywell, which in 1974 delivered the first model (System X-0) to the Naval Weapons Center for flight tests.

The flight tests were dramatically successful. Not only did Honeywell meet the exacting specifications for an air-to-ground missile application of the Advanced Tactical Inertial Guidance System, but in some cases it bettered the specifications by a factor of 10. Instead of providing merely the desired accuracy of 10 to 20 miles an hour, which means that a one-hour flight brings the missile within that range of the target, the new system provided accuracies of 2 to 3 miles an hour. Applying the system technology breadboarded by Naval Weapons Center engineers, Honeywell engineers and designers had markedly enhanced the system.

The technology of the inertial guidance system

U.S. Navy photo

Government researchers cooperated with industry to improve the laser gyro navigation system. Here, a scientist at the Naval Weapons Center at China Lake, California, adjusts the laser gyro mirror.

has a multitude of potential uses beyond tactical missile guidance. These include aircraft navigation and control, high-speed ship navigation, remotely piloted vehicle guidance and control, ship radar and launcher stabilization, small submersible vehicle navigation and control, and torpedo guidance and control. Of course, it will primarily be used for replacing the conventional gyro for aircraft navigation, a use to which the Honeywell engineers put the technology in the development of their inertial reference system.

Although it is difficult to determine precisely who was responsible for what, it is clear that the close partnership between Honeywell and the Navy resulted in an excellent product, a superior navigational system based on Honeywell's ring laser gyro and the Naval Weapons Center's experimental navigational model. On both sides, engineering skill led to an improved system, better test procedures, and more accurate documentation. Naval Weapons Center personnel understood that care in testing a new system is as important as the hardware itself, since, without such care and documentation, the system remains unproven. Besides testing the entire system, the Naval Weapons Center developed an automated process to remove fixture and rate-table misalignment errors, saving many test hours. Center personnel also improved methods to determine gyro random drift rates, and now these methods have become standard techniques in industry.

The expertise available at the Naval Weapons Center was noteworthy in two other areas, soldering technology and optics. In the latter area, for instance, Naval Weapons Center scientists helped to reduce backscatter of light and enhance performance.

Following the marked success of the first model, the Advanced Tactical Inertial Guidance System X-0, the Navy incorporated the advances made during the testing of the X-0 model into an improved system. A major consideration was that the system be relatively easy and inexpensive to manufacture in quantity. Using the Naval Weapons Center's facilities for producing weapon components in time of emergency, engineers honed their skills in manufacturing technology and used their technical expertise in furthering the design and development of the system and in preparing the specifications of a new Advanced Tactical Inertial Guidance System-2, for which Honeywell in 1976 was awarded a contract. The ATIGS-2 is now being considered for inclusion in the Navy's newest missiles such as the medium-range air-to-surface Tomahawk missile and the lightweight torpedo. Moreover, an ATIGS relative, the inertial reference system, is planned for inclusion in new aircraft such as Boeing's 757 and 767.

The ring laser gyro is an outstanding example of the level of achievement possible when technologists from the public and private sectors work together. Such transfers can lead not only to markedly improved devices like the ring laser gyro, but also to greater productivity and creativity throughout the industry. In this way, the scientists, engineers, and support personnel of the 779 federal laboratories play an important role in making American industry more efficient, as production of the ring laser gyro aptly illustrates. DMJ

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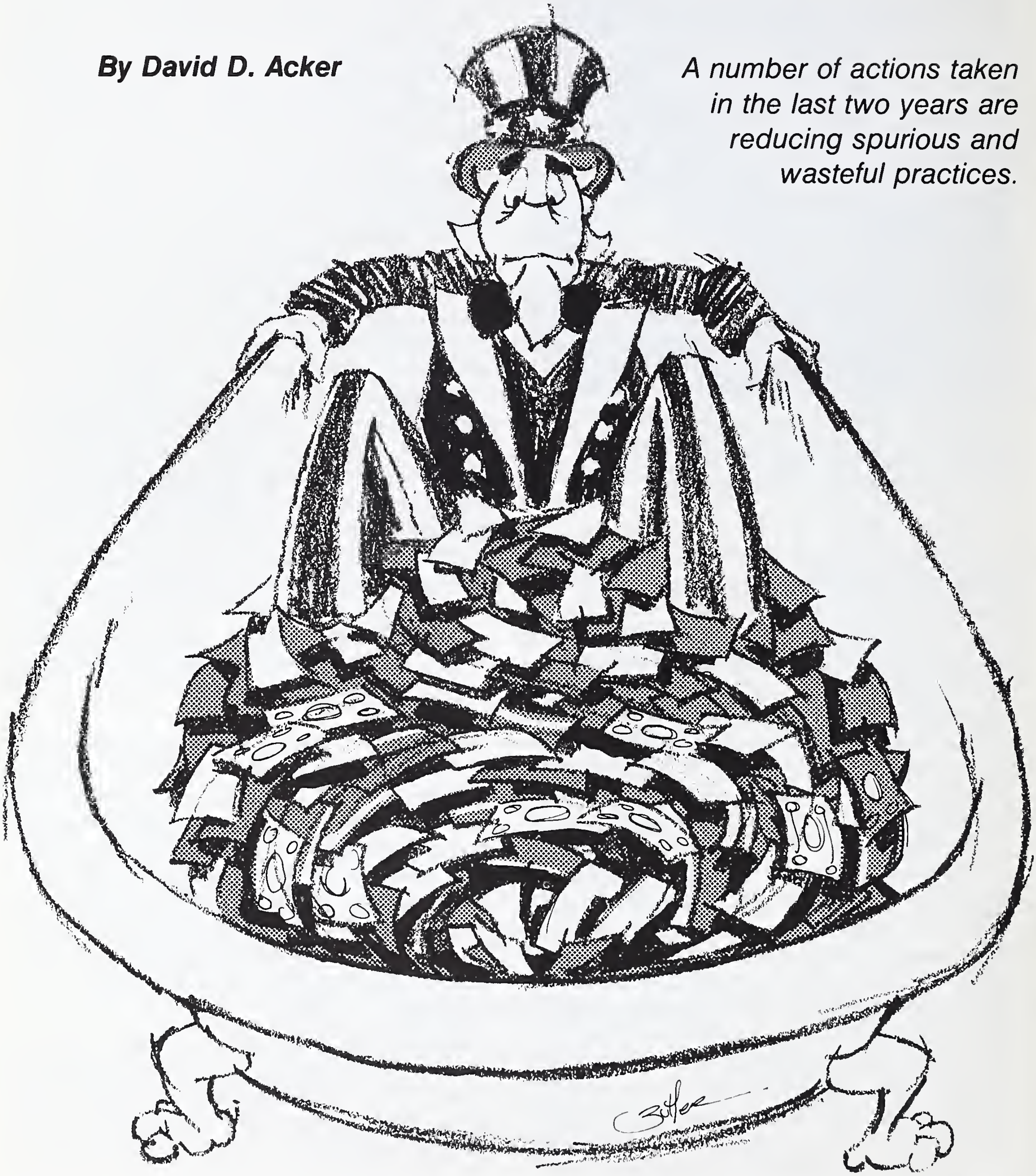
Putting the clamps on Government waste

By David D. Acker

A number of actions taken in the last two years are reducing spurious and wasteful practices.



The General Accounting Office estimates that as much as $40 billion may be lost to fraud in the United States annually. According to Justice Department files, fraud against the government ranks as the fourth most common crime in America.

Given such alarming statistics, it is not suprising that President Carter has highlighted the need for a concerted attack on fraud and waste. A 1978 memorandum alerted the chiefs of executive-branch departments and agencies to the President's concern that "eliminating waste, fraud, and error should be as important to you as your program objectives."[1] The President also reminded those executives that management of funds obtained through taxation is an important public trust.

Actions taken throughout the U.S. Government to combat fraud and waste are numerous. They include enactment of the Inspector General Act of 1978, which strengthened existing audit and investigative efforts within 12 agencies by establishing inspectors general. The attorney general accordingly has been directed to ensure that the activities of the inspectors general are coordinated with other investigative and prosecutorial actions. In addition, the director of the Office of Personnel Management has been directed to work with the attorney general and the secretary of the Treasury to improve the training of investigative and audit staffs throughout the executive branch.

In May 1979, the President established the Executive Group to Combat Fraud and Waste in Government, which is chaired by the deputy attorney general.[2] The group formulates policy and guides inspectors general and others tasked with prominent roles in the war on waste and fraud. That same month the President also established a Presidential Management Improvement Council, which supports efforts to improve federal management and program performance.

Further, the 1978 Civil Service Reform Act helps federal agencies eliminate duplication and take action against incompetent employees. It also prom-

Where patterns of waste have been detected

Findings of DoD audit and inspection teams have resulted in numerous corrective actions and policy changes. The following are representative examples of wasteful management practices that were uncovered.

Duplication of stockage

An audit disclosed duplication of material stocked at a general supply base and in theater depots in Europe. The excess quantities were valued at $2.7 million. The auditors recommended improved methods to identify material permanently stocked in theater depots, and management took corrective action.

Ammunition requirements

Auditors found that inadequate monitoring of ammunition requirements resulted in the accumulation of excess ammunition. This excess, ranging from 7 months to 44 years of supply, was evident for 75 percent of the items. The auditors estimated that FY 79 requirements for conventional ammunition and related components were exceeded by $4 million. Management agreed to revise local regulations. In the future, units will have to review ammunition requirements annually, and identify and report on-hand excess.

Administrative control of funds

An audit of a defense personnel support center disclosed that many contractor invoices received for payment at the center were not processed within the prescribed 30 days. Analysis revealed that approximately $900,000 could be saved annually by making timely payments of invoices offering discounts for prompt payment.

Stopping unneeded shipments

Auditors found that a logistics control activity's procedures for stopping unneeded shipments did not cover shipments from non-Army depots. They also discovered that some unneeded shipments from Army depots were not being stopped. Had prompt action been taken to stop all unneeded shipments intended for this activity during the last quarter of the fiscal year, a savings of at least $200,000 could have resulted. Management is now taking corrective action to prevent unneeded shipments.

Management of the Army club systems

An analysis of 12 Army Audit Agency reports of Army club systems disclosed prevalent weaknesses in management of food and bar operations. Sales accountability analyses and internal controls were not sufficient to prevent the loss or misappropriation of revenue and merchandise. In many instances, the wide disparity between expected and recorded sales had not been investigated. Corrective actions are being taken.

Contracted services

An audit revealed that service directives did not emphasize the need to consider alternatives to contracting out for automatic data processing services. In one instance, auditors found that contracting out cost $720,000 more than it would have if in-house personnel had been used. As a result of the audit, management revised the procedures for managing activities related to automatic data processing systems.

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[1] *Jimmy Carter, "Steps to Eliminate Waste, Fraud, and Error in Government Programs," memorandum for the heads of executive departments and agencies, 13 December 1978.*

[2] *Jimmy Carter, "Improving Management and Combatting Fraud and Waste in Federal Programs," memorandum for the attorney general; the director, Office of Management and Budget; and the director, Office of Personnel Management, 3 May 1979.*

ulgates rewards to efficient workers. Two years ago a program was launched to recognize federal employees who suggest improvements that save $5,000 or more. In the first year, $210 million was saved through the contribution of 1,380 persons from various departments and agencies. A side benefit is the Act's implied incentive to reduce waste and fraud.

Presently, a comprehensive study of fraud and waste is being conducted by the General Accounting Office's Special Task Force for the Prevention of Fraud and Abuse. The task force is evaluating management control systems in federal agencies and assessing the effectiveness of corrective actions taken as a result of the investigators' findings. The task force is determining the magnitude of the problem, pinpointing where breakdowns might occur, and making vulnerability assessments.

The General Accounting Office has established a nationwide telephone hotline which, after nine months of operation, has proven quite fruitful. Of more than 12,000 calls received from across the nation, the GAO determined that further investigation was warranted on 6,000 allegations. More than

2,000 cases were forwarded to agency inspectors general, and 37 major cases went to the Department of Justice for action. The largest number of allegations involved recipient fraud in social services. Most of the allegations against the Department of Defense involved procurement irregularities.

A breakdown of the complaints judged to be substantive reveals that 30 percent were made against federal employees, 22 percent against federal contractors, and 22 percent against individual recipients of federal aid. Of the 885 allegations involving federal employees, 241 involved working-hour abuses, 224 involved improper financial transactions, 108 involved theft, and 107 involved private use of government property. The rest were not grouped by category.

For its part, the Department of Defense has directed its top managers to increase their efforts to eliminate fraud and waste in defense programs. However, there are still some defense personnel who are not yet attuned to this important effort.

In DoD's response to the President's memo attacking waste and fraud, then Deputy Secretary of Defense Charles W. Duncan, Jr., stated that DoD managers "are reemphasizing the need for persistent, hard work at all levels of the Department to eradicate fraud and waste in whatever form it takes and, equally important, to bring effective preventive measures into our day-to-day operations . . . . Our plan is based essentially on use of present resources with no increase in personnel and only small increments in funding."[3] In this way, Mr. Duncan acknowledged that the problem of fighting waste and fraud was largely dependent on the quality and quantity of personnel resources that could be devoted to the effort. He did not view the problem as one that could be solved through capital investment.

In compliance with the Inspector General Act of 1978, DoD submitted a report to Congress describing the department's anti-fraud, anti-waste campaign. The report defined fraud as "any willful or conscious wrongdoing that adversely affects the government's interests. This includes, but is not limited to, acts of dishonesty that contribute to a loss or injury to the government." Under this defi-

The DoD project teams and their functions in the war on fraud and waste

Project team A	Develop definitions of fraud and waste so all DoD efforts have similar focus and use similar data base
Project team B	Develop pilot programs on fraud prevention surveys to be conducted by audit and investigation teams
Project team C	Develop systems to monitor DoD investigations referred to other agencies for further investigation or prosecution
Project team D	Resolve problems of personal liability for loss of government property
Project team E	Emphasize waste and fraud issues throughout the DoD planning process
Project team F	Strengthen follow-up systems for monitoring and reporting corrective management actions
Project team G	Study the effectiveness of coordination among audit, inspection, and investigative offices within DoD
Project team H	Develop a pilot educational program to alert managers to waste and fraud issues
Project team I	Develop a plan to improve training for those combatting fraud and waste in DoD
Project team J	Implement a pilot automated management information system to track the status of actions relating to fraud and waste
Project team L	Explore increased use of commercial audit firms
Project team M	Examine procedures for accountability of government-owned equipment in possession of contractors

Note: Project team K, originally intended to serve as an advisory committee, became a DoD task force.

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[3] *C.W. Duncan, Jr., "Report to the President: Department of Defense Programs to Prevent and Detect Fraud and Waste in Government Operations," letter of transmittal, 31 January 1979.*

nition, incidents to be treated as fraud include the falsification of time cards, purchase orders, or other documents; charging personal expenses to the government; diversion of government property or funds for unauthorized uses; submission of false claims for service not performed or material not delivered; and the intentional mischarging or misallocation of contract costs.

The report defined waste as "the extravagant, careless, or needless expenditure of government funds or the consumption or misuse of government property, resulting from deficient practices, systems, controls, or decisions. It also includes abuse of authority and other improper practices not involving prosecutable fraud."

With about three million civilian and military personnel throughout the world, the Department of Defense is of necessity a complex, decentralized organization. Consequently, it has traditionally approached waste and fraud in a decentralized manner, charging individual commanders and resource managers with accountability for the detection and prevention of waste and fraud. Now, however, DoD's new program uses both a centralized and a decentralized approach with no significant increase in cost. The program combines a centralized DoD-wide supervision and coordination program with a decentralized audit, inspection, and investigative program.

The audit program is carried out in three ways. First, internal auditors check for waste, fraud, and improper expenditures. They then provide DoD managers with objective evaluations of the efficiency of the operations. Second, resource managers conduct internal reviews to evaluate operational effectiveness and detect waste and improprieties. Third, the Defense Contract Audit Agency conducts audits which provide contracting officers with information helpful in negotiating contract prices and in determining proper payment. Although contract audits are not conducted for the specific purpose of detecting waste and fraud, such audits do sometimes uncover them.

During the six-month period that ended in March 1979, defense audit organizations collectively expended 2,634 direct manyears. Fifty percent of this time was spent in contract audits, 37 percent in internal audits, 12 percent in internal reviews, and 1 percent in audits of the military exchange system.

Operating in conjunction with the audit program, DoD's inspection program reaches into all levels of operations by virtue of two kinds of checks that differ in scope and depth. A general inspection consists of a broad examination of an activity, base, or unit; it is conducted by an inspector general team. A

special inspection looks into specific programs or functions; it is conducted by a command or DoD component team.

Finally, the DoD Investigative Program probes allegations of criminally fraudulent activity. This is the most direct response to possible fraud in the government. During the six-month investigation period, four investigative organizations expended 200 direct manyears on more than 3,500 criminal cases. Many of the specific investigations were in response to requests from DoD officials or leads received from individuals.

The audit and inspection organizations found patterns of waste in maintenance and repair, procurement and contract administration, personnel management and training, research and development, supply, support services, automatic data processing, energy conservation, comptroller functions, and other functions (see box on p. 39).

In 1978, the Secretary of Defense boosted DoD's centralized approach to fighting waste and fraud by appointing a steering group to oversee defense activities. The group is headed by the under secretary for policy, who is supported by the under secretaries of each of the military departments, the assistant secretaries of defense for comptroller and public affairs, and the OSD general counsel. Oversight of crucial DoD-wide audit policy is the responsibility of the assistant secretary of defense (comptroller), who is also responsible for issuing standards for audits and audit personnel.

The steering group meets regularly to set priorities, solve problems of coordination in existing programs, and assess responses to allegations of waste and fraud. The steering group also works to make DoD computer operations more secure from fraud and to vitalize public affairs efforts, ensuring that each allegation of DoD waste and fraud made by the media, the Congress, or U.S. citizens is tracked down and resolved.

Strengthening the centralized approach, the steering group last year set up 12 project teams to carry out DoD's objectives. Each team was charged with a specific mission (see box on page 41). Project team members were chosen based on the suitability of their individual skills. So far, the project-team concept has led to the resolution of specific problems without overextending organizational resources.

As the wide-ranging responsibilities of the project teams indicate, designing an effective program to clamp down on fraud and waste is not easy. Yet DoD is determined to expend the necessary effort. Each employee can help by becoming more sensitive to impropriety and more alert to mismanagement and abuse. Such individual responsibility, after all, is the nucleus of any campaign against fraud and waste. DMJ

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Designing a flexible management information system

**By Lt. Col. Thomas D. Clark, Jr., USAF
and
Capt. Douglas J. Blazer, USAF**

If management information systems are to be effective, they should contain data for long-term planning as well as data for immediate decisions.

The designation "management information" means different things to different persons. As a recent study on federal data processing points out, the term "management information" is inadequate to describe a number of information structures now used in the defense system. To many persons management information means a collection of computer listings, since a key purpose of any management information system is to provide data to the decision maker at the right time for making decisions necessary to achieve a particular goal.

Thus, analysis in DoD usually centers on the computer products expected from a management information system. This practice is fostered by some definitions given for a management information system. For example, one definition states that "a management information system is a formal system in the organization which provides management with the necessary reports to be utilized in the decision-making process." Actually, a management information system includes not just reports, but all information, manual and automated, used by managers to make decisions.

Since a management information system is more than a collection of reports, it is a complex task to conduct an analysis for design of such a system. An analysis of the kind of information that management needs and of ways that the information can be incorporated into the decision-making process will demonstrate that a true management information system provides information to the decision maker for planning and control, and can also provide automation for decisions that can be programmed. A current operating system will provide a conceptual framework for analysis.

The system analyzed here is the Air Force Standard Base Supply System, which is one of the best defense management information systems of its scope and magnitude in the Air Force today. The name may be somewhat misleading because no single management information system exists in a base supply activity. Instead, managers use a myriad of systems, each serving a specific purpose and applied at different management levels. Each of these smaller systems may be considered subsystems of a larger system, and the standard base supply system may in turn be thought of as a component of the entire base logistics system.

Discussion of a system used by the chief of supply at base level will illustrate the procedure of designing an information system to fit a specific need.

Before analyzing an information system, one must have an understanding of the process by which management makes decisions. This process may be portrayed with a model. A commonly accepted format for designing the model uses the familiar three-part division of input, process, and output. This format will be adapted here to depict the decision-making structure of the base supply system.

Analysis begins with the inputs to the decision-making system. The conceptual inputs are the mission and goals of the system, the participants' individual values, characteristics of the external and internal environments, and the states of nature that the system faces. The second step of analysis requires specification of the decisions that must be made and the input information required for making

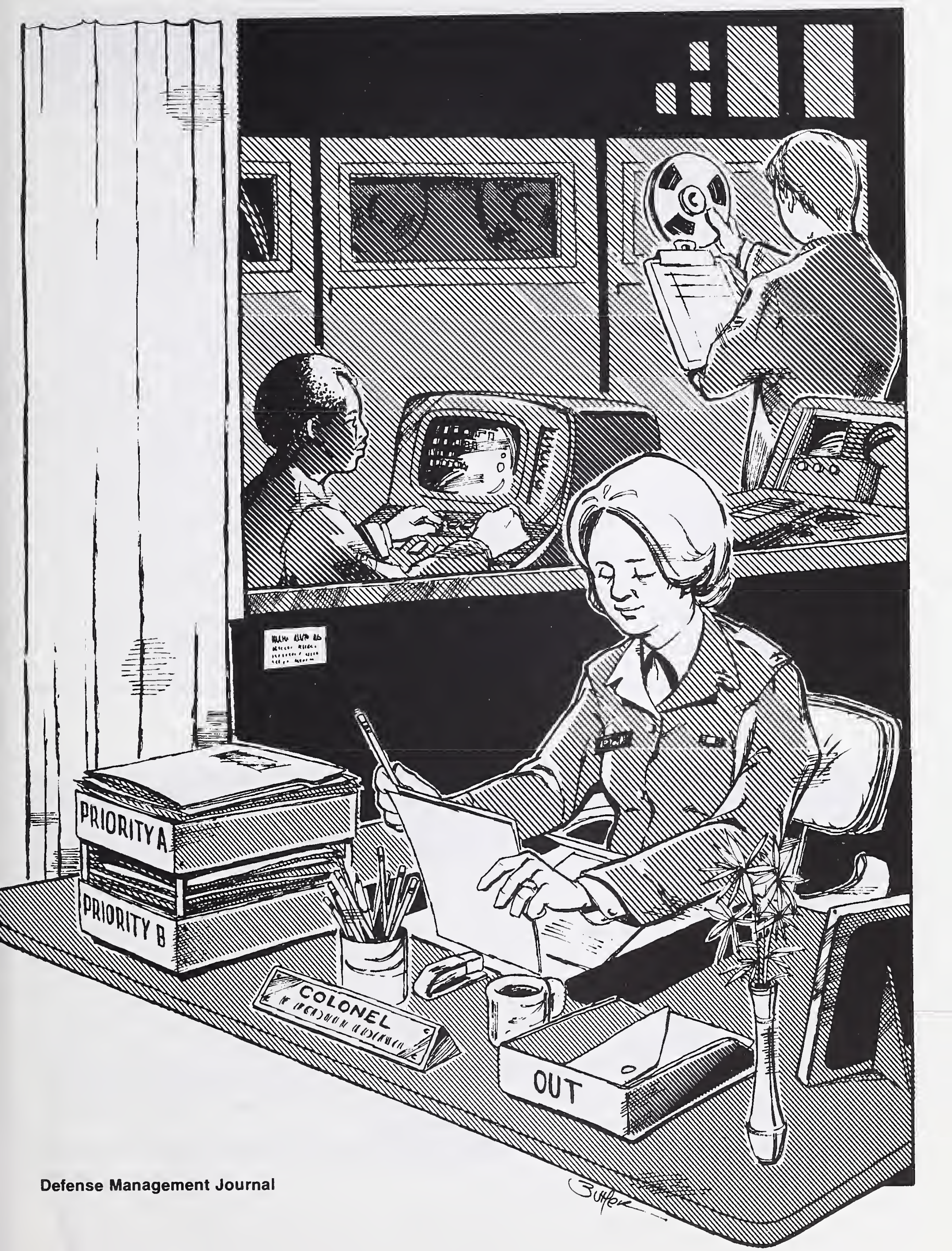
PRIORITY A
PRIORITY B
COLONEL
OUT
Butler

Figure 1. Typical strategic-level decision structure

Decision	Information required	Kind of information currently provided
What does the customer require?	Flying activity	None provided
	Base mission activity	Informal and sporadic
	Mission changes	Informal and sporadic
	Maintenance forecasts	None provided
How many items should be stocked?	Demand	Past history only
	Stock funds	Informal and monthly
	Order and ship time	Historical
	Safety level	Fixed by policy
	Customer training	Informal
How many items should be requisitioned, and when?	Mission priority	Force activity designator code or mission provided by policy
	Stock funds	
	Demand	
Where should the items be stored?	Work force availability	Informal (varies by chief of supply)
	Demand	
	Priority	
	Customer training	
When and how should the items be delivered?	Vehicle availability	Informal
	Priority	
	Demand	
	Work force availability	

The reader should note the absence of psychological and sociological factors, which are involved in any decision. Although not explicitly included, they affect decisions. For example, the commander's emphasis on supply or the supply chief's personal long-range plans affect the decisions in a supply activity. Information about such factors must be consciously developed.

those decisions.

The standard Air Force supply activity has a two-tiered decision structure. The first tier addresses what can be termed strategic decisions, and the second tier, operational decisions. Strategic decisions are non-routine and usually nonrecurring. Generally, they contain a good deal of uncertainty about outcome and address the system's long-term value and usefulness.[1] Operational decisions, on the other hand, address the system's short-term usefulness. Normally, they must be made before implementing the plans stemming from strategic decisions.[2] Choices at the operational level are often routine and recurrent. There is more certainty associated with their outcomes, and many times they can be programmed for computer solutions.

The current Air Force base supply system employs a relatively well-structured method that uses techniques dating from the 1950s and 1960s, when the system was being developed. At that time, management information system methodology focused on the operational level, and only in the 1970s was the focus directed more toward the strategic level. This was true because the hardware previously accessible to the management information system designer was limited. Now, a wide range of equipment is available, and failure to make proper strategic-level decisions seriously jeopardizes overall system effectiveness, regardless of the degree of success at the operational level. Defense supply systems that concentrate on operational decisions to the detriment of the total decision-making structure are unacceptable today.

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[1] *Frank E. Harrison,* The Managerial Decision-Making Process, *Houghton-Mifflin Company, Boston, Massachusetts, 1975.*

[2] Ibid.

The strategic-level decision-making structure is the macro level. A key to any model at this level is understanding of the system's goals, which must be explicitly stated. In the supply field, the primary goal is to provide material support to base-level users. This comprehensive objective typically includes a number of secondary objectives. For example, one might establish an 80 percent issue effectiveness rating (the ratio of issue upon demand to requests) and a 5 percent or less non-mission-capable supply rate as realistic secondary objectives.

Figure 1 outlines the key decisions and information requirements typical at the strategic level. Although Figure 1 does not include all the decisions a chief of supply may make, nor all the information required, the model does provide a foundation for identifying necessary decisions and information.

As Figure 1 illustrates, the system starts when a base-level user makes a request for an item. After receiving a request, supply personnel must determine if the item is directly available. If it is not, it must be ordered from an appropriate depot. Available items will be issued and delivered to the customer. This is a relatively simple, yet useful, process model of a supply system.

The decisions necessary to control supply operations are a direct result of the objectives identified by analyzing the general objectives of the supply system. Understanding the link between operating decisions and the general objectives of the system is the key to analyzing operating decisions. The user who understands the connection can eliminate extraneous information from the system. Figure 2, a useful outline of some typical operational decisions and the information required for them, illustrates the direct link between the operational-level decision areas and the system objectives.

The operational process begins with a computation of requirements for an item. Currently, this takes place upon receipt of a request for the item or, if no requests are received, at least once in each quarter of the year. Computation of requirements determines if additional items are needed. If so, the next step is deciding whether to order the item. If the answer to *any* of the decision questions is negative, no items are ordered.

A critical analysis of the management information system currently used in the standard base supply system rests on a comparison of the information provided with the information required. Figure 1, which provides the comparison for the macro model, shows that the base supply system collects, stores, and reports a vast amount of data on historical demand and order and shipment dates, and yet most of the information necessary to support the strategic-level model either is not provided or is provided through more informal systems. Further, the data

Figure 2. Typical operational-level decision structure

Decision	Information required	Kind of information currently provided
When and how should the requirements be computed?	Demand	Historical data
	Time (once per quarter)	Provided
Should the stock level be changed?	Level on hand	Provided (real-time mode)
	Order and ship time	Historical data
	Safety level	Provided by higher authority
	Special levels	Collected and provided
	Time since last demand	Provided
	Demand	
Should the items be ordered?	Money	Informal
	Criticality	Provided
	Demand	

are simply collected and reported, not converted to a form of information that can be used to make decisions. There is no summarization or trend analysis made on this data to assist in long-range, strategic planning. Very little causal information is given to answer questions about the reasons underlying various situations.

At the operational level, in contrast, most of the data required in the decision process is available (see Figure 2). Many of the operational-level decisions, including stock replenishment, in the base supply system are made automatically. At the operational level, in addition, the system is cybernetic, although the feedback arrangement consists merely of a chain in which the output of one decision becomes an input to the next decision. In other words, the system is somewhat self-adaptive. If a demand forecast for an item turns out to be too low, the system will note the error and order more of the item.

The key issue is base supply system effectiveness. In the base supply system, supply chiefs receive a monthly supply/equipment management report, which indicates how well the system is working and identifies problems. The report is designed to provide information to solve those problems, but, unfortunately, it seldom does; in fact, it rarely identifies the real problem. For example, one management indicator in the report lists the number of items that have maintained a certain level for over 365 days with no demand.[3] Items in this category exceed a pre-established standard, which would certainly suggest that a problem exists. But a determination of the correct stockage would require considerable additional information. For example, one would need to know the dollar value and criticality of the items, the base mission, and the effect on mission support of canceling the special level. Thus, the information about records, regardless of its significance, is useless since the system does not provide the additional information required to make a stockage decision.

Another example is the fill rate for priority A and B requests. If this rate were below 60 percent, it would be considered below standard by many observers, including the authors.[4] Yet the system does not establish the level of demand because it does not provide information about the number of item requests that were first or second orders; nor does the system indicate the cost of stocking the items. Increasing the priority fill rate may decrease bench stock and thus compromise the system. For the most part, the system focuses on the operational level.

Even with its shortcomings, the base supply system is one of the very best systems of its scope and magnitude in the Air Force today. In its development and maintenance, the base supply system is far superior to many other Air Force systems. The user remains the prime driver in developing and modifying the system, which was developed as an operational-level system with integrated subsystems and programmed decision making. Thus the base supply system was developed using what were then popular techniques.

But the base supply system is not all that it could be. The system's designers failed to include one key factor of the program-data base approach: the requirement of different types of information for different sets or levels of decisions.

Although the base supply system did not fall into two pitfalls commonly encountered in developing management information systems—the lack of user involvement and the omission of decisional analysis — its failure to consider the strategic decision-making structure in supply reduces its efficacy. A clear understanding of an organization's structure is the key to effective decision-support system design.

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[3] *AFDSDC Recurring Publication 67-1.* Selected Items Review, *Air Force Data Systems Design Center, Montgomery, Alabama, February 1978.*

[4] Ibid.

Presidential management internships

by Steven M. Shaker

A new internship program grooms public administration graduates for federal service.

Photo by Larry J. Wilson

As a result of a new management internship program, 465 men and women with advanced degrees in public management fields have been attracted to federal service. The graduates were chosen through a competitive process that ensures the selection of highly motivated individuals who will both benefit from the plan's training opportunities and make useful contributions to the agencies employing them.

The Presidential Management Intern Program brings to fruition President Carter's pledge to provide a new developmental program for public managers as part of civil service reform. Upon his election, President Carter appointed Alan K. Campbell, Dean of Syracuse University's Maxwell School of Citizenship and Public Affairs, to be the new director of the Civil Service Commission, now called the Office of Personnel Management. Under Campbell, the Presidential Management Intern Program was initiated in 1977 by Executive Order 12008.

Earmarking the program is the careful screening given applicants. Candidates for internships undergo a number of selection rigors that bypass the traditional entry methods of the Professional and Administrative Career Examination and the mid-level placement process. First, public administration professors recommend to the dean individuals whose academic performance has been superior. The dean then submits nominations to the Office of Personnel Management, which reviews each nominee's credentials to ensure that he or she meets the basic eligibility requirements.

In the second phase of the procedure, a regional screening panel, consisting of state, local, and federal managers, observes the candidates in group discussions, interviews them, and judges their written essays. Nominees are evaluated in terms of interpersonal dynamics, leadership ability, public-service commitment, and skill in communication, problem solving, and decision making. Superior candidates are screened by a final review panel at the Office of Personnel Management.

Using individual performance ratings and incorporating veteran preference factors, this panel selects 250 finalists and designates 50 alternates. Selection for the initial group produced a heterogeneous mix in which nearly half were women and a fifth were minorities.[1] The nationwide distribution was also diverse, with every state represented.

Interns receive excepted appointments at the GS-9 level. After their first year, they are promoted to the GS-11 level, and after successfully completing the second and final year, the intern may obtain a GS-12 rating along with conversion to career-conditional civil service status.[2]

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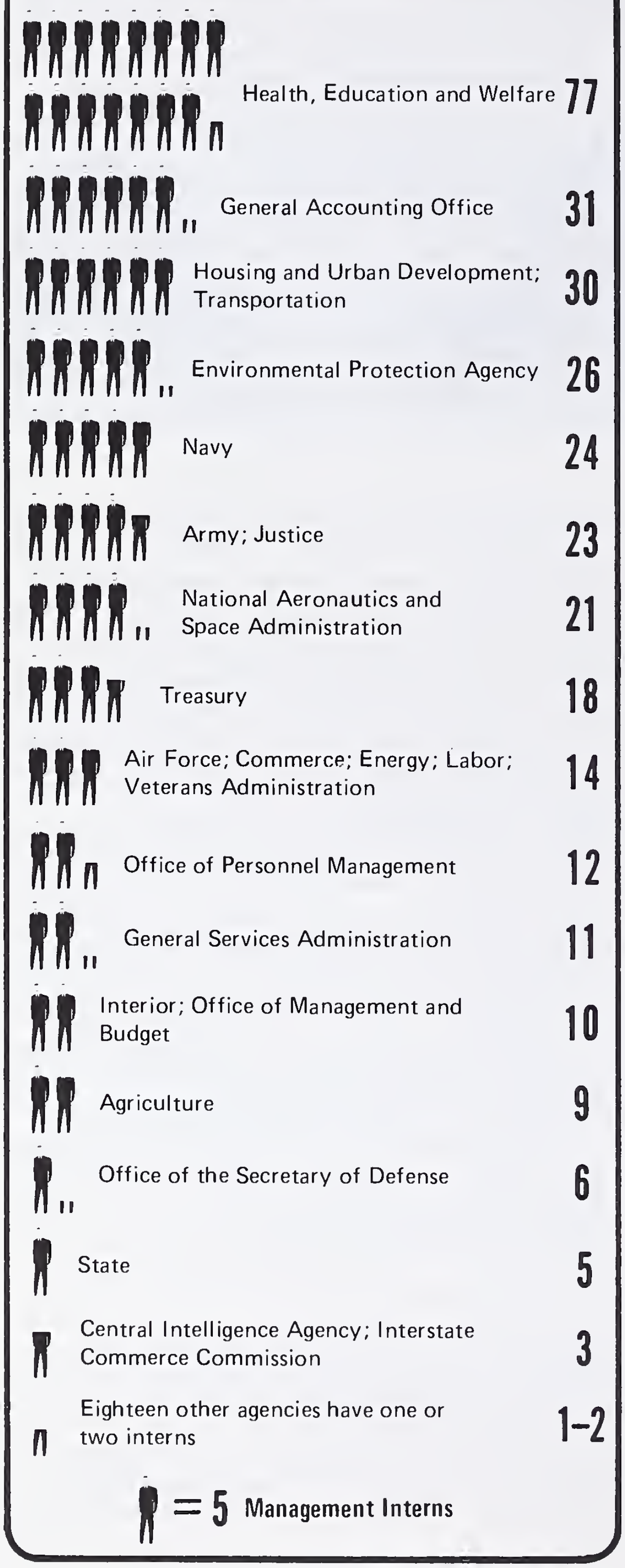
[1] *Maslyn, Robert T., "Images of the Public Service: Perspectives of First-Year Presidential Management Interns,"* The Bureaucrat, *Spring 1979, pp. 28-32.*

[2] *Campbell, Alan K. and Strakosch, Lynn D., "The Presidential Management Intern Program: A New Approach to Selecting and Developing America's Future Public Managers,"* Public Administration Review, *May-June 1979, pp. 232-235.*

Figure 1. Agency distribution of 1978 and 1979 Presidential Management Interns



Upon their selection, management interns are referred for placement to some of the more than 30 federal agencies, including the Department of Defense, that have created internship positions (see Figure 1). The interns pick the agencies they wish to interview with. The agencies then offer positions to the most suitable interns, who may accept the offer or reject it and seek intern opportunities elsewhere.

After the interns are assigned to their adopted agencies, the Office of Personnel Management and the employing organization jointly assume the responsibility for providing a series of developmental experiences. OPM presents a three-day orientation at the beginning of the internship and conducts a residential seminar at the conclusion of the first and second years of the internship. All these sessions focus on career planning, group dynamics, and professional growth exercises developed by the National Institute of Public Affairs. The agencies provide on-the-job training designed to prepare the intern for his or her target assignment. Agencies are tasked with providing interns with a working knowledge of at least three of six management areas: procurement, budgeting, management information systems, program analysis, personnel management, and management analysis. Interns become versed in the areas through job rotation, special project assignments, or other methods devised by the agency. In addition, each agency assigns a high-level official to serve each intern as a mentor in developing and fulfilling training objectives.

Another OPM-coordinated feature of the program is the cluster group, a forum where interns from different agencies meet to discuss government, administration, and policy issues. Each cluster group consists of about 20 interns, a resource person, and a cluster leader—a high-ranking federal official who serves as a catalyst in the group discussions. The resource person, who assists the cluster leader in planning, organizing, and preparing 12 cluster sessions during the two-year internship, is someone affiliated with an academic department of public administration. Guest speakers also participate. Each cluster session is devoted to a particular topic, such as the political-career executive interface, congress in the administrative process, national security, program evaluation, and the management of change.[3]

The Department of Defense is the second-largest employer of Presidential Management Interns, next to the Department of Health, Education, and Wel-

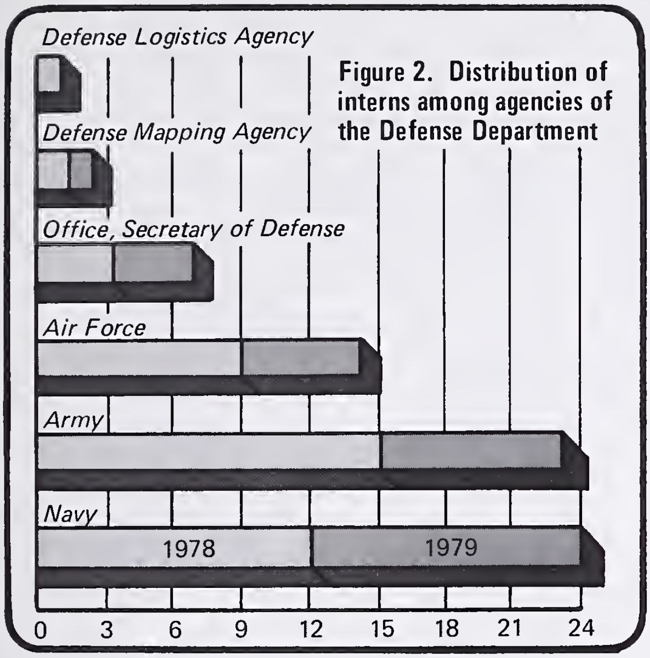


Figure 2. Distribution of interns among agencies of the Defense Department

fare. DoD has a diverse group of 70 men and women serving in its various agencies (see Figure 2). When asked why they chose the Department of Defense, many interns pointed to DoD's history of management innovations such as operations research, PERT methodologies, and the planning-programming-budgeting system. Other DoD interns expressed interest in the national security field or had a simple preference for the location. Each DoD agency administers its program in its own way. Both the Air Force and the Army have placed interns into established assignments in logistics, program management, budgeting, personnel, procurement, intelligence, and manpower.

The Naval Air Systems Command, where I am an intern, has a rotational system whereby the interns spend about two months in each of a number of functional areas and project offices responsible for activities such as personnel administration, program management, and procurement. Rotation exposes the interns to different groups and promotes general understanding of the organization. Eventually the intern selects a permanent position with a group he or she has rotated through.[4]

My own experience consists of a core assignment to the Advanced Systems Directorate, supplemented by stints at the Naval Weapons Center at China Lake, California, and at the Naval Air Development Center in Warminster, Pennsylvania. Other Naval Air Systems Command interns were assigned temporarily to outside agencies such as the Office of Management and Budget and the Office of Federal Procurement Policy, providing them a range of knowledge that will help them in dealing with these agencies in the future. In the Office of the Secretary of Defense, interns have been placed in established positions rather than rotated through various stints. One intern even attended the Strategic Arms Limitation Treaty discussions in Geneva.

The internship program encourages further education, and many interns continue formal studies even after completion of their master's program. DoD's interns have attended a number of management and defense-related classes and seminars. Air Force and Navy interns have completed month-long courses in program management at the Defense Systems Management College. Interns acquire additional seasoning by attending monthly dinners addressed by respected and influential speakers.

The Presidential Management Intern Program is experimenting with some innovative recruitment and professional development practices which OPM plans to evaluate in terms of the impact on public management. If the internship program is deemed a success, many of its innovative practices will be adopted by other recruitment and training programs. Clearly, the Presidential Management Intern Program is providing its participants with valuable opportunities for professional and personal development. In return, the interns will surely make a positive contribution to federal management.

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[3] *"Presidential Management Intern Development Program," National Institute of Public Affairs, July 1978.*

[4] *"Your Career in the Naval Air Systems Command," U.S. Government Printing Office, 1979, p. 31.*

U.S. Air Force photos

Labor-management relations at Tinker Air Force Base: fair and fundamental

By Major General Cecil E. Fox, USAF

An article on federal labor unions in the March 1978 DMJ *was illustrated with photographs of employees of Tinker Air Force Base carrying informational picket signs. Tinker's commanding officer, Major General Cecil E. Fox, responded with a letter stating that labor-management relations at Tinker have been sound and productive for a decade. Here, General Fox outlines Tinker's approach to the challenge of effective labor-management relations.*

You are a supervisor directing a dozen employees, including one union steward. You know that under the bargaining agreement the steward can devote a reasonable amount of official time to representational activities, but you must determine when and for how long he may leave his duty station. One day you notice that the steward has signed out to an administrative office on union business, but he has neglected to ask your permission. When the employee returns an hour later, do you reprimand him? Do you charge him an hour of pay? Do you tell him he must consider the hour as annual leave taken? If you take any action, is there a danger that the action will be considered discriminatory or retaliatory, even anti-union? Could the employee file a charge against you?

This is just an example of the kinds of questions that must be resolved countless times daily at a large industrial complex like Oklahoma City Air Logistics Center at Tinker Air Force Base. At Tinker, management has taken a number of steps to address difficulties like that described above. Every one of Tinker's 1,500 supervisors, for instance, attends a training program to learn about the union contract and about behavior that is appropriate in responding to employees. As a result of such programs and similar activities, dialogue between management and labor at the base never ceases.

Tinker Air Force Base, with about 16,400 civilian and 5,500 military employees, is Oklahoma's largest single employer. Some 14,000 eligible employees are represented by Local 916 of the American Federation of Government Employees, which is affiliated with the AFL-CIO.

Oklahoma City Air Logistics Center has a broad range of technical, engineering, and logistical responsibilities, including the calibration of precision measuring equipment, the development of nondestructive testing techniques, and the logistics management function for more than 1,800 aircraft, almost 1,600 missiles, and over 70 percent of all jet engines used in Air Force combat aircraft. A depot-level facility, Tinker houses one of the largest jet engine overhaul activities in the United States. Disassembly of one engine yields thousands of parts which are chemically cleaned and repaired when necessary. Each month the base ships upwards of 200 tons of material, ranging from microcircuits to engine components.

The center's large and complex mission calls for a diversity of skills in its work force. In such an environment, cooperation between management and all employees is requisite to effective labor relations.

In 1968, Local 916 of the American Federation of Government Employees was granted exclusive recognition as a bargaining agent at Tinker. Ten years later, partly as a result of the 1975 amendments to Executive Order 11491 that promoted the consolidation of bargaining units, the five centers of the Air Force Logistics Command, in various parts of the country, formed one bargaining unit to be represented by the AFGE, the nation's largest federal union, at the major command level rather than a local level.

Creation of a command-wide bargaining unit was followed by negotiation of a command-wide Master Labor Agreement serving all five centers. The uniform contract, which went into effect in May 1979, standardizes many personnel policies for AFLC installations. Most importantly, expansion of the bargaining unit means that many general issues are handled centrally. A full-time labor-relations staff headquartered at Wright-Patterson Air Force Base in Dayton, Ohio, is responsible for overall administration of the contract. The staff at the headquarters level shapes command-wide policies, spearheads negotiations and at the command level, intervenes in third-party issues, and coordinates activities involving all five centers.

At the local level, however, each base still addresses matters specific to it. Tinker's management staff continues to conduct itself according to its well-established standard of respect for the concerns of employees. The foundation of this standard has developed over the years out of sturdy managerial tenets, which management regards so seriously that it has codified them into seven basic principles:

- Management must be aware of and respect employee organization goals, and must not challenge employee loyalty to such organizations.
- Management must negotiate with integrity, adopt a problem-solving approach to collective bargaining, and be responsive, determined, and effective in every kind of bargaining environment.
- Management must interpret and administer the collective bargaining agreement consistently and in accordance with the intent of the parties expressed at the negotiating table.
- Management must process grievances under the

negotiated procedure quickly and fairly, and must respect the right of employees to express dissatisfaction.

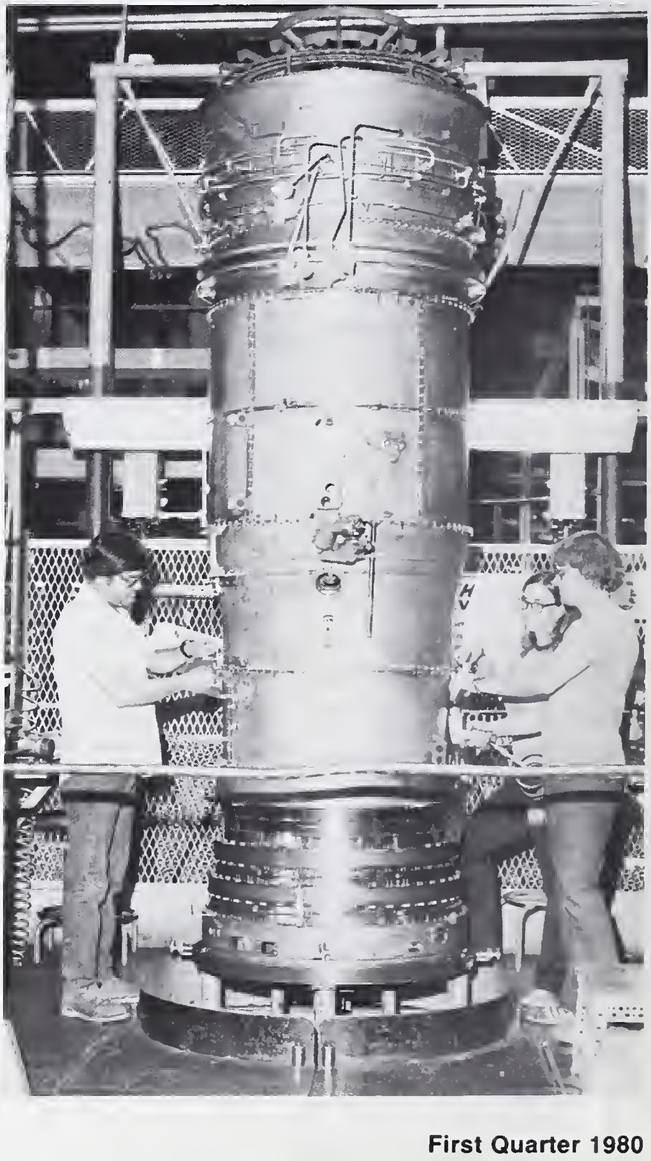
- Management must recognize the valid role of unions and accept the idea that employees must have a real voice in determining personnel policies and working conditions affecting them.
- Management must have a strong, continuous, well-organized labor-relations function with well-defined policies and philosophies.
- Intra-management communications on labor-relations matters must be highly developed and responsive. These principles fuse with the present contract to form what both labor and management feel is the basis for a mature, workable relationship.

Despite the specificity of contract provisions, though, there arise discrepancies of interpretation and application. When a dispute arises, an individual employee, a group of employees, the union local as a whole, or the employer may file a grievance under the negotiated procedure of the Master Labor Agreement. Grievances may be filed also over a wide array of employment conditions not specifically addressed by the contract. If not satisfied with the ultimate grievance decision, the moving party, be it union or management, may invoke the contract's arbitration procedure. The arbitrator, a neutral third party jointly selected by union and management, then hears the case and rules on the issue. The arbitrator's decision, with rare exception, is final.

Whereas a grievance generally concerns specific employment conditions, an unfair labor practice charge goes beyond the scope of the contract and involves broad union rights as established under the law. Unfair labor practice charges are addressed by the Civil Service Reform Act of 1978. If the complainant has brought such a charge, and if the General Counsel of the Federal Labor Relations Authority determines the charge has merit, then the case will be heard by an administrative law judge under the same authority.

In employee-filed grievances at Tinker, the issues most frequently involved are working conditions such as shift changes and overtime distribution, granting of leave, and disciplinary actions. Union grievances typically center on working conditions and the mechanics of the negotiated grievance procedure. In the case referred to earlier involving the union steward who left his duty station without authorization, the steward was docked an hour of pay. The steward argued that past practice in his office did not require that he ask the supervisor's permission before leaving his duty post; moreover, he felt that he was being penalized in retaliation for serving as a steward. He filed a grievance, and in arbitration the steward's loss of pay was upheld.

As the above case illustrates, simple matters such as the loss of one hour's pay for one employee can, in a labor-management relations context, be quite time consuming for both sides. Happily, though, the difficulties are usually overcome, and most of the grievances are settled by the parties themselves, without invoking third-party proceedings. Deserving of mention here is a recent unfair labor practice charge involving a supervisor who tried to discourage a union steward from performing his legitimate



role of representing employees in grievances. Clearly chagrined that such an incident could occur, top-level management at Tinker publicly repudiated the supervisor's actions in a notice posted on bulletin boards throughout the base.

This ability to resolve so many differences internally is a prominent feature of labor-management relations at Tinker AFB, attesting to the active dialogue that exists between the two sides. Supervisors are usually as responsive to individual employees as management in general is responsive to the union, since in each case management makes an effort to hear what the individual employee or the union has to say. Although the union is energetic in bringing complaints, no unfair labor practice complaint against Tinker's management has ever been sustained by a third party.

Oklahoma City Air Logistics Center can point to a number of measures it has taken to teach its managers about the federal labor-management program and to pursue its commitment to meet the union at least half way. For instance, in 1976 a detailed guide to interpreting the contract was developed for management officials. In addition, supervisors continuously receive vigorous in-house training in labor relations, as when, after the new contract took effect this year, Tinker's labor-management relations staff conducted training sessions over a three-month period to introduce virtually all 1,500 supervisors to the new provisions.

Tinker Air Force Base believes in teamwork, whether assembling a J-75 jet engine (left), testing jet engine accessories (below), or handling issues in labor-management relations.

A noteworthy principle was first adopted at Tinker. The center was the first federal facility to apply the 1975 Supreme Court case of *NLRB* vs. *J. Weingarten, Inc.*, which gives private-sector employees the right to union representation in an interview which the employee believes may involve disciplinary matters. A similar right was later bestowed on all federal employees by the Civil Service Reform Act.

Perhaps the best example of the center's commitment to constructive labor-management relationships is the joint training program for first-line to mid-level supervisors and the 200 union stewards. The course was designed locally to improve communications between supervisors and employees on labor-relations matters. Representatives of Local 916 and Tinker AFB wrote the course outline, chose private consultants as instructors, and shared out-of-pocket expenses.

In stating that "labor organizations and collective bargaining in the civil service are in the public interest," the Civil Service Reform Act recognizes the principle that constructive dialogue between unions and managers can balance conflicting viewpoints and encourage efficient agency operations. Management at Tinker AFB is determined to adhere to that principle, conducting government operations efficiently while also considering the interests of employees.

Federal employees do not have the extensive bargaining rights of workers in the private sector. Nonetheless, the situation at the Air Logistics Center of Tinker Air Force Base illustrates that civilian defense workers are well represented in diligent labor negotiations and well served by sound management. Tinker's example demonstrates that good labor-management relations in the federal sector can serve not only workers and managers, but the country as well. DMJ

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U.S. Navy photo

Formulating improved figures of merit in aircraft acquisition

By Charles Stiles

The design of the logistics system may affect aircraft operational readiness as much as the design of the aircraft.

Throughout the development of an aircraft, emphasis must be placed on those design elements that affect logistics support. Currently, these elements, or figures of merit, are specified in the request for proposal, request for quote, and the request for information. They address such areas as operational availability rates, maintenance manhours per flight hour, and operational readiness.

Commitment to design-related goals without an understanding of their impact on logistics-sensitive elements can lead to deficiencies in the logistics system. When determining the true impact of a figure of merit, one must distinguish between design-related contributors and complementary logistic-system contributions.

Through its maintenance material management system and its maintenance data collection system, the Naval Aviation Maintenance Program generates a wealth of data and establishes basic definitions of and methods for calculating readiness figures of merit. Currently, there are seven primary states of readiness for squadron-assigned aircraft.

Mission Capable. The aircraft can perform at least one of its primary missions.

Full Mission Capable. The aircraft can perform all of its missions. The term represents operational readiness degraded by any reduced material condition or not-fully-equipped elements.

Partial Mission Capable, Maintenance. The aircraft is limited in the performance of some of its missions because at least one mission-essential subsystem is not fully operational and is in need of maintenance. This figure of merit reflects failure rates as well as the logistic system's maintenance capability. It is a composite of aircraft reliability and maintainability characteristics and logistic-system characteristics. For this analysis, the reduced material condition is assumed to be primarily a function of aircraft reliability and maintainability characteristics rather than of the logistic-support system characteristics.

Partial Mission Capable, Supply (PMCS). The aircraft is limited in the performance of some of its missions because at least one mission-essential subsystem is not fully operational as a result of a lack of installed parts. The element reflects the availability of items in the supply system. It is usually attributable to the logistic-support system.

Not Mission Capable, Maintenance (NMCM). The aircraft is down for maintenance. This figure of merit is a function of reliability and maintainability design characteristics such as mean flight hours between maintenance actions and elapsed maintenance time per maintenance action.

Not Mission Capable, Supply (NMCS). The aircraft is down until items are available through the supply system. This is directly related to the design and implementation of the logistic-support system and is often assumed to be related to failure rates.

Aircraft Waiting Maintenance. The aircraft is down for maintenance which is not being performed because of a lack of manpower, facilities, or equipment, or because of priorities that affect work schedules. All of these reasons are directly related to the design and implementation of an integrated logistic-support system.

These seven figures of merit reflect the status of the aircraft at the squadron or organizational level. Each is calculated as a percentage and consists of the ratio of the hours in each category to the total hours that the aircraft belonged to the squadron.

A comparison of mission-capable and non-mission-capable figures of merit provides a fair indication of readiness. The mission-capable rate can be made very high for specific operational needs by virtue of the dynamics of the logistics system. Spares can be redistributed, personnel reassigned, or work-schedule policies revised. Logistics-related variables make this pair very volatile and difficult to predict. Another pairing, one of observed elements — aircraft design performance and logistic-system performance—is equally volatile in terms of interaction and is difficult to analyze and predict.

Less volatile is a pairing of the downing aspects of the aircraft design with the full mission capability of the design. From a very simplistic perspective, this pairing identifies the aircraft's maximum potential mission capability. This is limited only by inherent design characteristics.

Three new figures of merit are proposed. Two apply to the future monitoring and evaluation of both aircraft performance and logistics performance. The third applies to the analysis of existing data and the determination of any correlations.

Logistic system support capability (LSSC) is the sum of all logistic system-sensitive figures of merit, including not mission capable, supply; partial mission capable, supply; and aircraft awaiting maintenance. As a percent of owned hours it is suggested as a comparative logistic figure of merit.

Aircraft weapon system capability (AWSC) is the sum of existing aircraft-sensitive figures of merit, including full mission capable; not mission capable, maintenance; and partial mission capable, maintenance. As a percent of owned hours, it is recommended as a comparative aircraft-readiness figure of merit.

Design–full mission capable (D-FMC), the third of the three proposed figures of merit, is the combination of the current full systems capability and the new logistic-support system capability. In effect, it provides an insight into the maximum achievable capability constrained by aircraft design characteristics only. It assumes a perfect logistics system and includes all the dynamic aspects of such a system.

A figure of merit can be used to reflect the performance of a single aircraft, squadron, wing, or fleet, or the entire inventory of a particular type of aircraft. Similarly, a figure of merit can be measured over periods ranging from one day to life-to-date. It is therefore important that the time frame and the organizational level of the data base be defined whenever a readiness figure of merit is used as a design criterion or as a measure of operational performance.

At present, readiness figures of merit in an operational environment reflect how design requirements have been met; however, rarely do they reflect either the time frame for achieving the goal or the current value. The interaction of elements such as policies, funding, pipeline delays, and schedule changes can make this a very volatile value. Moreover, for purposes of monitoring or comparing, it does not separate the aircraft contribution from the logistic-system contribution.

Two types of analyses were performed. First, the mean-life-of-data-base characteristics for the aircraft considered were used in a stepwise regression analysis to determine correlation of D-FMC with design parameter sensitivity. Second, a paretal type of analysis was performed to identify the relative contribution of the reliability of a weapons-replaceable assembly to its contribution to hours reported Not Mission Capable, Supply-Partial Mission Capable, Supply.

The regression analysis of the proposed figures of merit consists of four basic steps:

- Divide the mean readiness figure of merit into the contribution of aircraft charcteristics and logistic-system characteristics
- Perform stepwise regression analyses using potentially significant life-of-data-base parameters and their transformations to determine if a correlation can be established between D-FMC and meaningful parameters
- Perform detailed analyses of residuals to validate the parametric contributions
- Evaluate supporting evidence

It should be noted that data on logistic parameters are not available in as much detail as are data on maintenance and operating parameters as provided by the maintenance material management system. Consequently, once the contributors to the figures of merit are categorized as either aircraft characteristics or logistic characteristics, the effort can concentrate on developing a relationship for the aircraft characteristics by assuming a perfect logistics system.

The data base on which the recent analyses of aircraft were performed contained 63 months of data from January 1973 through March 1978. The aircraft used in the analyses included 7 types, 11 models, and 20 series, accounting for roughly 90 percent of all the flight hours accrued by tactical fleet aircraft during that time frame. The data base included the total fleet inventory of these aircraft assigned to operational commands.

Five-year geometric means were established for each series of aircraft at the organizational level for the following parameters:

- Mean flight hours between failure
- Total mean flight hours between failure
- Elapsed maintenance time per maintenance action
- Elapsed maintenance time per flight hour
- Mean flight hours between maintenance actions
- Full mission capability

These five-year means are representative of the cumulative performance of the aircraft in terms of maintenance, repair, and support. They are considered conservative indicators of real maintenance-design characteristics because of the length of time (life-of-data base) over which they were generated. Analysis of the distributions of these parameters revealed no deviation from a normal distribution.

The regression analyses revealed that the best combination of long-term conservative aircraft design characteristics of the 15 evaluated aircraft consisted of—

- Gross takeoff weight
- Empty weight
- Failure rate observed at the organization level
- Months in service
- Maximum velocity

The resulting equation is:

$$\text{D-FMC} = 92.9857 - 0.34295 \times (\text{GTOW-MTW}) + 6.7709 \times \text{LOG}(\text{OMFHBF}) - 0.67967 \times (\text{MIS} \times \text{Vm})$$

where:

Gross takeoff weight and empty weight are in thousands of pounds

Months in service is in years

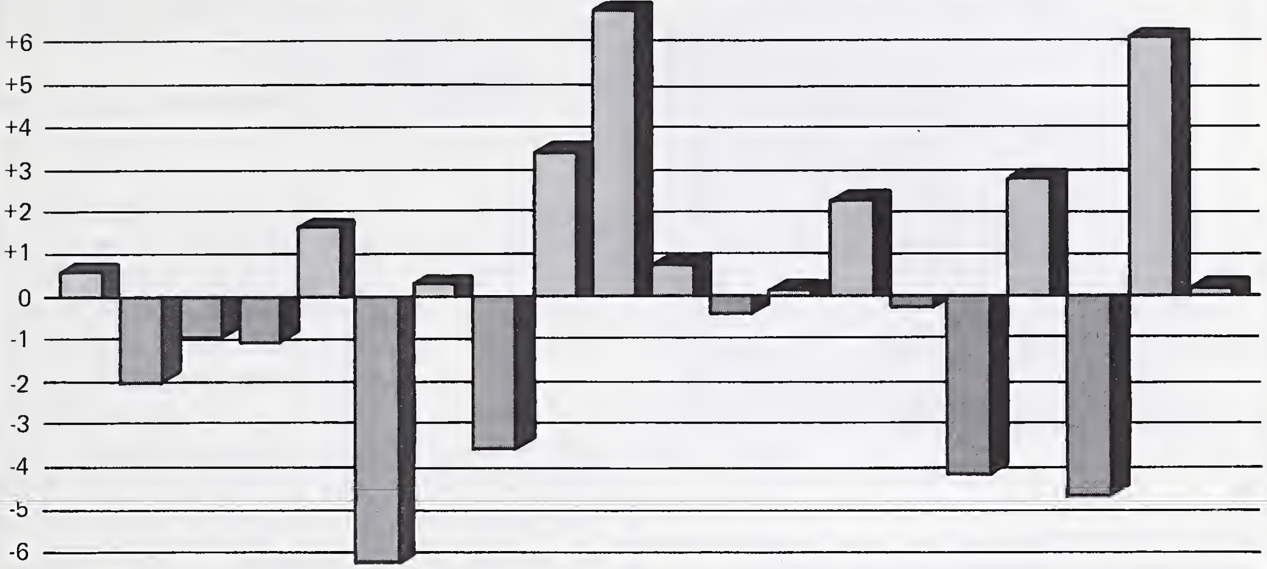
Maximum velocity is in increments of the speed of sound

The validity of the regression equation is apparent based on the following criteria:

Standard deviation of residuals is 2.6% FMC
Mean response is 2.45%
Mean absolute residual is 1.9%
Multiple correlation coefficient is 86.43%

Figure 1 is derived from the data for the 20 different types, models, and series of aircraft in the five-year data base. The figure, which reflects the difference between the calculated and observed values of design–full mission capable, shows that the observed values fit the line of regression exactly in a quarter of the cases. Eighty-five percent of the calculated values were within 5 percent of the observed values, and none of the calculations was off by more

Figure 1. Percent of error of predicted Design-Full Mission Capability data from observed D-FMC data for 20 different aircraft in a 5-year period



than 7 percent from the observed values.

Of course, further analysis is necessary to determine if some subtle combination or transformation of parameters will explain more precisely the remaining basis. The above regression equation provides only a general means for predictive and comparative analysis of design contributions. Unique regression equations having a much higher correlation have been developed for each aircraft; however, the prime purpose of this analysis was to identify those general parameters that can be used to evaluate the logistic-support system and to predict future performance of new designs.

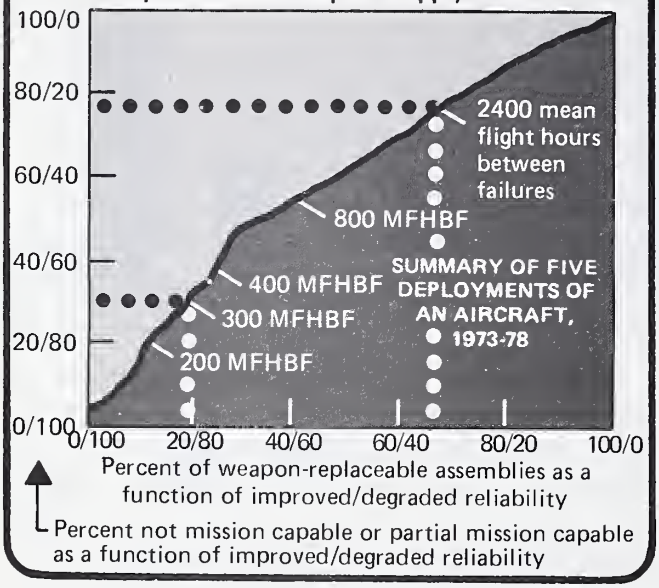
It must be emphasized that the equation addressed the predicted mean life-of-data-base value of D-FMC. It is a value representative of the performance of the operational fleet inventory of an aircraft over an extended time period and does not represent short-term observations of a week or month.

The logistic-support system has many dynamic parameters that are subject to a multitude of transients that cannot be evaluated during the logistic-support analysis, which is often predicated on many assumptions about the expected logistic environment. However, many of the implementing policies that are assumed to be in place during the logistic-support analysis are totally unconstrained when the aircraft becomes operational. Provisioning policies, allowance list policies, manpower availability, pipeline times, and range and distribution of spares are just a few of the facets about which assumptions must be made when an aircraft's logistic-support system is being developed.

A brief overview analysis of the reliability of weapons-replaceable assemblies that have caused an aircraft to be down due to NMCS-PMCS highlights some elements for consideration. It can be demonstrated, utilizing the same five-year, 20-aircraft data base, that NMCS is unrelated to failure rate and that NMCS-PMCS contributed the largest decrement in logistic support system capability. Certainly, improved reliability is essential; however, it is always a statistical value identifying the probability, not the possibility, of a failure occurring. Obviously, if no failure or demand ever occurred there would be no need for a spare, repair, or a sensitive logistics system. However, once a failure has occurred, even on an extremely reliable component, the logistic-support system response time reflects how well the logisticians have designed and implemented the logistics system.

The aircraft concerned will be hard-down until the relatively reliable component can be supplied. This process tends to promote creation of a hangar queen that provides parts for replacement of other highly reliable components. On the other hand, NMCS-PMCS is sensitive to failure rate as it applies to provisioning. The process of developing the aviation

Figure 2. Contribution of weapon replaceable assemblies to not-mission-capable-supply and partial-mission-capable-supply rates



consolidated allowance list for aircraft carrier deployment requires many compromises between failure data, available spares, available funds, storage volume, pipeline times, and personal judgment. The compromises are not always compatible with the assumptions made during the logistic-support analysis performed during early design phases of an aircraft.

Most simulation models of aircraft deployed in an operational environment on an aircraft carrier have shown that sparing two of everything in addition to the usual sparing for items that fail frequently holds NMCS-PMCS to a minimum. This can rarely be achieved from a cost, volume, and procurement viewpoint.

Figure 2 reflects the percentage of line-replaceable WRAs as compared to their percentage contribution to NMCS-PMCS. The WRAs have been ranked by their individual failure rates for the time periods concerned. The data represent a composite of five deployments of a particular type of aircraft to the Mediterranean and Western Pacific during 1977 and 1978.

Example 1 in Figure 2 shows that some 20 percent of the weapons-replaceable assemblies experienced a failure in 300 flight hours or less, which is relatively poor reliability. Those failed assemblies contributed some 30 percent to the cumulative NMCS-PMCS. At the other extreme is Example 2, which shows that about one-third of the WRAs had a failure reported every 2,400 flight hours or more. While this is relatively outstanding reliability, such failures nevertheless contributed some 25 percent to the cumulative NMCS-PMCS.

The figure emphasizes the need for greater attention to methods for redistribution of spares. One of the solutions worth examining is stocking one or more of the items with a high failure rate in a forward-based mobile logistic stock point. This would place all downing spares within a rapid response time of the demand. The establishment of dedicated aviation support ships in company with the carrier task force or mobile logistic support force may provide a method for marked improvement in NMCS-PMCS and the LSSC readiness figures of merit. Within the context of the future unit deployment possibilities of vertical/short takeoff and landing aircraft and the extremely limited support resources available to remotely deployed units, feasible new concepts must be defined.

Admittedly, some simplifying assumptions have been made in the interpretation of some elements of the data. However, the pattern is clear—the aircraft cause can be separated from the effect of logistics. In essence, it is feasible to predict readiness figures of merit based on the aircraft design characteristics by using the design–full mission capability. The overall logistic support contribution to readiness can be monitored and evaluated on the aircraft level using the existing data and the logistic-support system capability figures of merit. It also appears that visibility should be expanded to track the real-time contribution of the weapons-replaceable assemblies, particularly those having a high mean flight hours between failure. Indeed, logisticians must examine new concepts and policies in terms of alternative spares distribution to minimize response times for high mean-flight-hours-between-failure items.

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The Army's vanishing civilian work force

Report synopsis by Managing Editor Thomas J. Gelli

Since the days of the Continental Army, civilians have played a key role in helping the U.S. Army accomplish its mission. Today, the Army has in its employ approximately one civilian for every two uniformed personnel. These civilians serve around the world in more than 1,200 occupations. As of March 1979, the Army had about 428,000 civilian employees, of whom 394,000 were paid from appropriated funds.

Clearly, the Army is highly sensitive to any budget cuts or other constraints that reduce the size and capability of the civilian work force. In the last five years, while the level of military strength has remained stable, civilian manpower authorizations have dropped 12 percent despite an increase in the civilian workload. According to a special report from the Association of the United States Army entitled "Where did all the people go? The Army's vanishing civilian work force," this double whammy of more work and fewer people has led to, among other things, constrained base operations, more contracting out, and reduced unit readiness.

The report goes on to describe how the nature and composition of the Army's civilian work force has changed considerably since 1954 (see Figure 1, p. 62). There has been a marked shift from blue-collar to white-collar positions, many of which require advanced education and specialized training. This shift is evidenced by substantial gains in the science and engineering category, while manufacturing, once a significant in-house mission, is accomplished almost entirely by contract.

Between 1974 and 1977, civilian manpower in the Defense Department decreased 8 percent; conversely, the rest of the executive branch increased manpower 8 percent. By FY81, DoD must further trim its civilian work force by 11,000, with the Army absorbing 3,500 of the losses. In the last five years, the Army alone has lost 55,000 civilian spaces.

DoD policy calls for the use of civilian personnel in all positions "which do not require military incumbents for reasons of law, training, security, discipline, rotation, or combat readiness, and which do not require a military background for successful performance of the duties involved." This policy has generated occasional civilianization campaigns, a course of action that seems logical but which often proves disadvantageous to the Army because converted military spaces are frequently lost in budget cuts and because promised replacement civilian spaces never seem to eventuate.

The report notes that one indisputable point stands clear from the maze of statistical data: despite periodic, ephemeral gains, the Army's civilian manpower strength has declined significantly in the last decade. And according to the Secretary of the Army, the challenges created by this decline have been met with only limited success. The true impact on force readiness, he observed, is difficult to quantify but nonetheless is readily visible in several key areas including the wholesale logistics system, the use of borrowed military manpower, and military quality of life.

Wholesale logistics system. The degradation in the wholesale logistics system and the attendant shortfall in support for field units are reflected in the noticeable drop in repair-parts stock availability. This is in addition to a worsening on-time processing rate during a period of mounting requisitions. Also, the procurement and maintenance backlogs are growing daily.

Borrowed military manpower. This practice of commanders using military personnel to replace lost civilians is leading to a degradation in unit training and readiness. Under this practice, soldiers often work outside their skill area and consequently lose some of their individual proficiency and may experience deflated morale. Furthermore, soldiers are being used in installation-support roles when their units may be in need of their attention and skills. It must be kept in mind that during mobilization, borrowed military manpower must abandon their immediate responsibilities and return to their units for deployment. The Army estimates that no less than 15,000 military personnel are borrowed to perform civilian-type work on any given day.

Quality of Life. Civilian reductions in areas of soldier support have led to a shortfall in the upkeep of the soldier's living and work areas, which in turn has resulted in a drop in morale and a reduction in recreational activities and health services. This erosion of the soldier's quality of life is a thorn in the side of recruitment and retention.

Figure 1. Occupational distribution of Army's civilian work force

Since 1954, supply and maintenance jobs have dwindled while scientific and administrative professions have prospered.

	October 1954 (percent)	October 1978 (percent)
Science and engineering	10.9	16.6
Supply	23.1	15.0
Equipment operation and repair	14.6	12.8
Facilities maintenance	20.0	10.8
Health and education	4.5	9.5
General administration	3.6	11.2
Manufacturing	5.9	negligible
Transportation	5.6	3.8
Budget and accounting	4.8	6.2
Data systems	negligible	4.7

Cuts in the civilian work force have affected the Army's major commands in different ways. For example, the U.S. Army Training and Doctrine Command, which looks to civilian employees for stability, continuity, and institutional memory in the face of rapid military turnover, has experienced a steady decline in civilian and military personnel since FY74. TRADOC base operations have suffered a 42-percent reduction in civilian employees in the last decade. Its supply operations, up 32 percent in volume, have suffered a 13-percent civilian-manpower reduction. The transportation function has absorbed a 32-percent reduction which has led to a substantial increase in the use of borrowed military manpower. Vehicle down time has increased 31 percent. Quality-of-life features such as libraries, recreation centers, and crafts shops have dropped from 992 in 1974 to 763 today, and their hours of operation have been trimmed. And although there have been increases in the size and complexity of permanent buildings requiring maintenance, TRADOC facilities-engineering staffs have lost one out of every seven employees since 1974.

> **"In the last five years, while the level of military strength has remained stable, civilian manpower authorizations have dropped 12 percent despite an increase in the civilian workload."**

In the U.S. Forces Command, where roughly 8,300 borrowed military personnel have been used in civilian jobs since FY74, the real-property maintenance backlog has jumped 73 percent. In the transportation arena, vehicle down time has risen 31 percent since 1974.

The report states that in the U.S. Army, Europe, officials contend that there is a civilian employee shortfall of 10,000 and that the situation is worsening. Much of the work done by USAREUR civilian employees is now being done under contract. Contract costs, however, have sometimes exceeded the in-house cost for the same work. Also, these civilian manpower deficiencies have reduced USAREUR's ability to issue supplies quickly in an emergency, have increased the likelihood of material deteriorating from inadequate care, and have increased demurrage costs. Real-property maintenance has been deferred, and medical and recreational services have de-

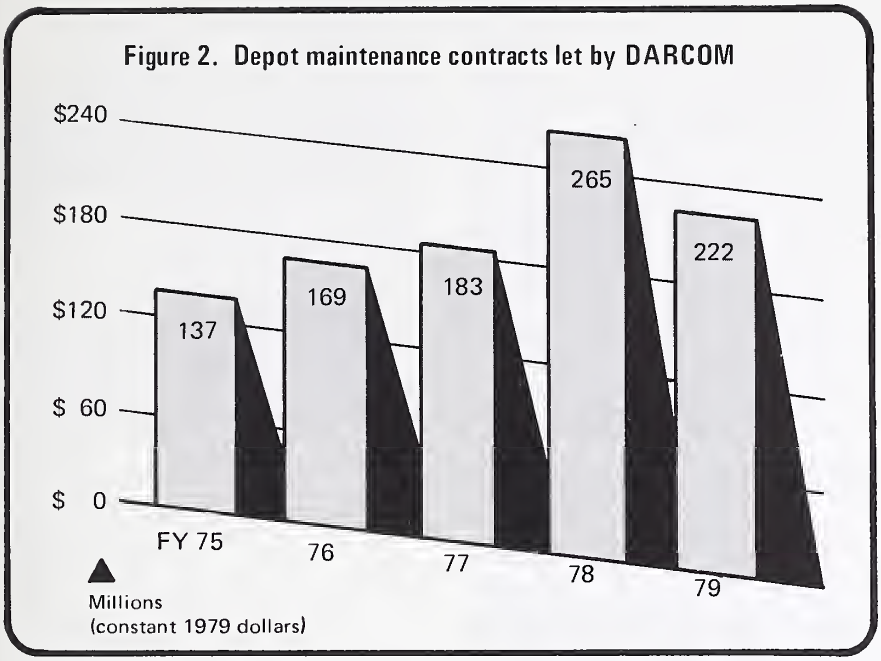


Figure 2. Depot maintenance contracts let by DARCOM

clined markedly.

Perhaps the hardest hit of the Army's major commands is the U.S. Army Materiel Development and Readiness Command, the Army's biggest employer of civilians. DARCOM is responsible for materiel development and support from design through disposal, and many of its civilian positions require specialized or technical skills.

Since the early 1960s, DARCOM has lost nearly 80,000 civilian employees and now employs roughly 112,000 civilians. Despite this sharp decline, though, DARCOM's workload has grown tremendously, particularly in the last several years. It now supports 16 rather than 13 divisions. Equipment density is extremely high, yet the ratio of combat arms personnel to support personnel is widening. The number of line items managed and the number of item requisitions are both up. Not surprisingly the backlog of procurement actions reached an unprecedented high in FY79. Additionally, two years ago, DARCOM assumed the huge role of single-service manager for conventional ammunition, so that it is now responsible for the production, storage, and transportation of all the conventional ammunition used in DoD.

This civilian manpower reduction has forced DARCOM to contract out a significant amount of its depot-level maintenance. In fact, the dollar value of FY78 contracts is practically double that of FY75 contracts (see Figure 2). The slight tail off in contracting out between FY78 and FY79 does not reflect a policy change, but rather a cut in the depot maintenance budget, which only lengthens the backlog. Even more ironically, although there are not enough employees to perform the necessary maintenance on prime equipment, at the same time there are not enough Army contracting specialists to award and administer timely depot-level maintenance contracts.

Emerging from this snowballing reduction in civilian manpower are a handful of recurring themes, two of which are increased contracting out and the imposition of manpower ceilings.

Contracting out. The emphasis on contracting out has fluctuated over the years depending on the administration in office and the mood of Congress. Today, there is substantial reliance on contracting out especially when doing so appears prudent, desirable, and advantageous to the Army. When done properly and for such things as laundry services and custodial services, contracting out may be more cost-effective than in-house performance.

Advocates of contracting out contend that contractors exercise

"Emerging from this snowballing reduction in civilian manpower are a handful of recurring themes, two of which are increased contracting out and the imposition of manpower ceilings."

greater economy by controlling the number of people on the payroll. They can hire and fire without having to go through the time-consuming procedures imposed on government managers. And finally, advocates contend that once a contract is let, the operation is less likely to be adversely affected by budgetary fluctuations.

But a heavy reliance on contracting out has some distinct disadvantages as well, according to AUSA's report. For one thing, it is not always possible to contract out, especially when the installation is in a remote area or when the size of the contract is small. Also, it is entirely possible that there may be no bidders who can beat the in-house cost. Furthermore, contracting out in overseas areas where the value of the dollar has declined is seldom a cost-effective measure.

If there are not enough bidders to ensure true competition, contract costs can rise dramatically at renewal time. At one installation, for example, the contract cost to cut grass was $30,000 for first year and $180,000 the second year due to lack of competition.

Those opposed to extensive contracting out point out that it is a complex and time-consuming process that requires a significant amount of lead time and does little to relieve the problems stemming from immediate manpower shortages. Also, contracted work can be interrupted by strikes at contractor plants, which is a concern of many military leaders. In-house advancement of technology may decelerate. And lastly, contracting out limits the commander's flexibility to shift resources among various missions and activities.

Imposition of manpower ceilings. For many years the Army has been pinched by manpower ceilings imposed by Congress and the administration in power. Such ceilings serve as a handy device by which officials may take credit for controlling the size of the bureaucracy. Today, ceilings tend to handicap the command in the field by limiting his flexibility in using personnel. A commander may find that he has a sufficient number of spaces but insufficient money to fund them, or vice versa. The Army strives to coordinate space and fund allotments, but sometimes the two do not come out even. At present, the Army appears to have adequate funds to compensate for manpower ceilings by using contract personnel. However, the future value of manpower ceilings is dubious since no effort has been made to impose any such ceilings on contractors.

Although the Army's civilian personnel problem is principally that of declining numbers, there are some others. As part of a federal effort to control grade creep, the government has reduced its average white-collar grade level. Interestingly, at the end of FY78, the Army white-collar work force had an average grade of 7.60. This was lower than the Navy (8.13), Air Force (7.69), and government-wide (8.15) averages.

The controversy surrounding the Army's vanishing civilian work force will undoubtedly persist for years to come. For now, the shortfalls created by manpower reductions and ceilings are being neutralized by increased contracting out, a practice that many contend is nothing more than robbing Peter to pay Paul. In any event, the report concludes, the precipitous drop in civilian manpower is affecting the Army in ways that could well be eroding its true strength and readiness.

Youth or experience in military manpower: balancing the variables

Report synopsis
by Associate Editor
Carolee B. Hartman

Should the military services maintain their emphasis on a youthful force? Not according to a recent study from the Brookings Institution in Washington, D.C. The study contends that a young, inexperienced force may have been appropriate for earlier military needs, as during World War II, but that present circumstances call into question the continued wisdom of sacrificing experienced manpower for an influx of novices on whom, in the aggregate, a vast sum is spent for training.

The authors of the monograph, entitled *Youth or Experience? Manning the Modern Military,* are Martin Binkin and Irene Kyriakopoulos, who point out several reasons that today's all-volunteer military force should not continue to be the neophyte group which was "originally tailored to fit the needs of a military establishment of an earlier era," when a high turnover of personnel was not considered detrimental to the effectiveness of the force.

A number of changes, however, are working today to raise doubts about the efficacy of the all-volunteer force as it is presently constituted. The study points out that in 1977, 60 percent of the nation's 1.8 million enlisted personnel were under 25 years of age; nearly 90 percent were under 35. These figures are in striking contrast with comparable data for the civilian sector, in which less than a quarter are under age 25 (see Figure 1, p. 66).

The youthfulness of today's military force influences its ex-

“‘The military’s preoccupation with youthfulness at the expense of experience,’ the study claims, ‘may not be providing the nation with the most effective armed forces possible at current budgetary levels.’”

pertise, state of preparedness, cost, turnover rate, and size. Most significantly, a youthful force is an inexperienced force. In 1977, 59 percent of enlisted personnel had less than 4 years of service. Yet there is a growing need for trained technicians. In 1945, for example, only 28 percent of enlisted personnel had jobs in white-collar areas such as electronics, but by 1977 that figure had climbed to 46 percent (see Figure 2).

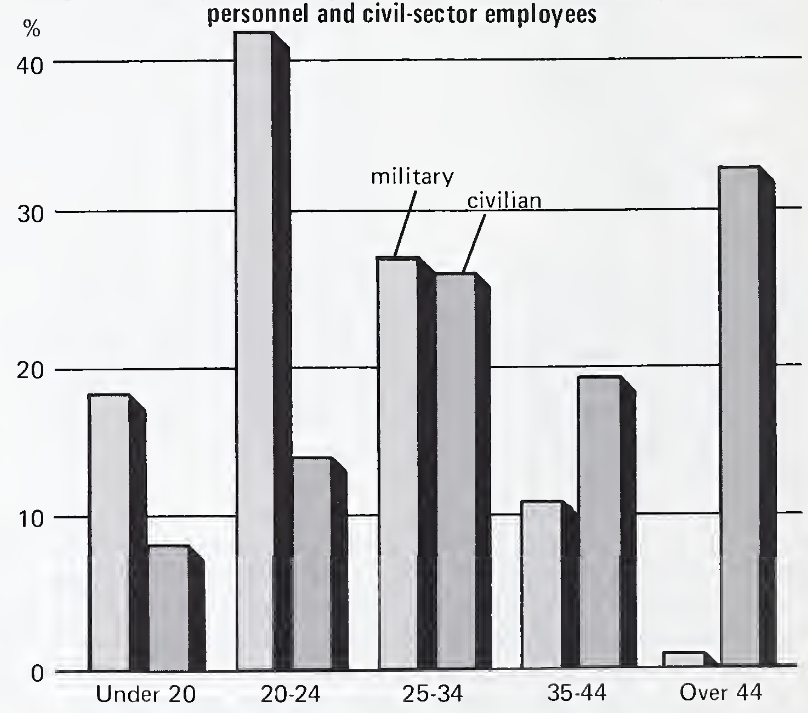
While acknowledging the difficulty of correlating years of experience with technical expertise, the monograph purports that increasing technological complexity of military occupations calls for an increase in average years of experience. “The military’s preoccupation with youthfulness at the expense of experience,” the study claims, “may not be providing the nation with the most effective armed forces possible at current budgetary levels.” Young, inexperienced military workers occupy many technical and craft positions which could be better filled by seasoned personnel.

The study tackles several standard counterarguments opposing an older, more stable military force. One formidable impediment to a seasoned force is the U.S. military establishment’s traditional belief that youth and vigor are necessary for performance of most military activities, especially combat tasks. This view, the study claims, is based on opinion, not fact. The study questions the contention that all enlistees must be fit for combat, pointing out that not all military jobs require physical hardiness.

Moreover, older service members are not necessarily less fit. Evaluating the components of physical fitness, the study reports that the military has only vaguely defined the relationships between specific physical skills and certain jobs, and that young persons are not necessarily better able to perform certain tasks. Simple reaction time, for example, diminishes by only 5 percent between age 20 and age 60.

Another canon that the Brookings study attacks is that the military reserves can be supplied only when there is a large turnover rate in the active force. Currently, reserve forces draw many recruits from veterans who leave the active force. But the reserves are not dependent on the skills these veterans bring with them. The study claims that in the Army National Guard more than 60

Figure 1. Comparison of age distribution between military enlisted personnel and civil-sector employees



Sources: Military Data - Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics)
Civilian Data - Employment and Training Report of the President, 1978 (GPO, 1978)

percent of the enlisted personnel over age 35 serve in unskilled or clerical occupations. Younger, new enlistees with minimal training could thus fill many of these positions.

Finally, the study grapples with the outmoded notion that a constant turnover of young, inexperienced recruits keeps costs down. It is true that senior personnel are paid higher wages, that many enlistees need additional financial incentives as inducements to lengthen their service, and that older workers are more likely to become eligible for retirement annuities and to require higher medical, housing, and travel payments.

All of these objections, however, are offset by the savings generated by a more senior force. Retention of proven workers, the report states, lessens the need for replacements and lowers expenditures for recruiting, outfitting, training, and relocating personnel. These expenditures are unprecedentedly high, not only because of inflation but also because the advent of the all-volunteer force has been accompanied by several costly factors, including an increasing proportion of recruits who fail to complete initial enlistment and an expansion of expensive campaigns advertising for recruits.

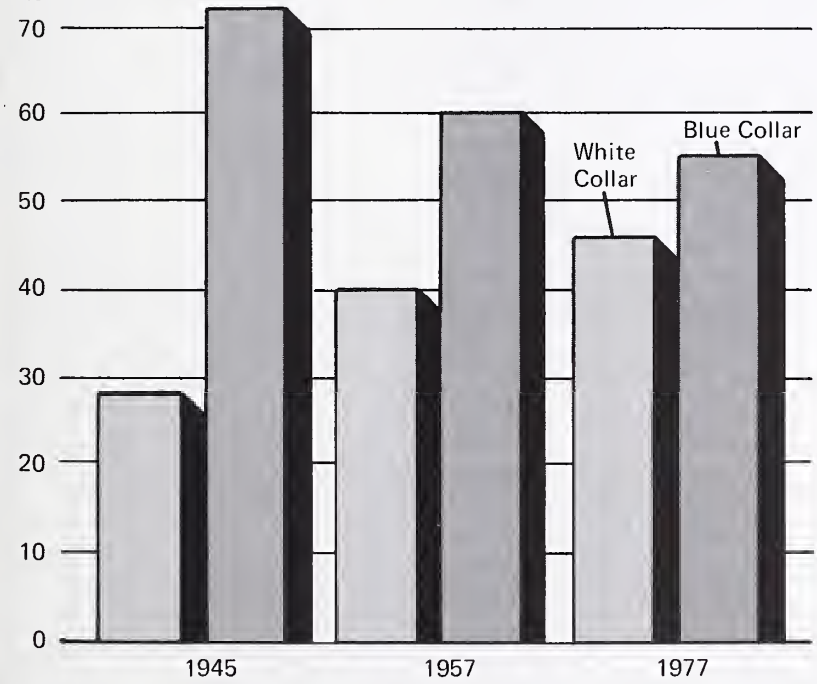
The study suggests alternative ways to reshape the military manpower system in order to increase its experience level and use defense investments more efficiently. Short-term attempts to improve retention by means of financial inducements—as opposed to long-term efforts such as major modifications in the structure of military compensation and length-of-service policies—should focus on increasing the number of first-term reenlistments among trained technicians and craftsmen. This would result in a monetary savings and an increase in the experience level of the military forces.

At a more fundamental level, reforms in the retirement system could increase incentives to longevity of service. Modifications in the personnel management system could redistribute earnings and promotion opportunities.

The study concludes by urging the Pentagon to explore immediately short-term methods for reducing attrition among experienced personnel, and to examine long-term methods for striking a better balance between youth and experience in the military. DMJ

> **“Short-term attempts to improve retention by means of financial inducements . . . should focus on increasing the number of first-term reenlistments among trained technicians and craftsmen.”**

Figure 2. Distribution of trained military enlisted personnel by occupational category



Sources: Data for 1945 and 1957 from Harold Wool, The Military Specialist: Skilled Manpower for the Armed Forces (Johns Hopkins Press, 1968)
Data for 1977 from Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics)

DoD Legislative Proposal 96-4

NATO standardization

A bill designed to improve NATO standardization, interoperability, and readiness is included in the Department of Defense legislative program for the 96th Congress. The proposed act would authorize U.S. forces stationed in NATO countries to acquire goods and services from NATO allies without formal procurement contracts. Reciprocally, it authorizes our NATO allies to obtain goods and services from the U.S. forces pursuant to agreements in lieu of foreign military sales contracts. The use of intergovernment agreements would facilitate the development of common terms, conditions, and procedures for mutual support within the Alliance and thereby simplify the support problem in peacetime and during hostilities. This legislation also provides authority for the logistics support of NATO aircraft in the United States and Canada. The scope of this act is confined to logistics support and specifically excludes major equipment purchases and the acquisition of aircraft, naval vessels, tracked combat vehicles, naval torpedoes, strategic missiles, and nuclear capable missiles.

DoD Legislative Proposal 96-34

DOD military retirement and disability fund

Now before Congress is a bill to establish a Department of Defense military retirement and disability fund. If enacted, the bill would amend Title 10 of the United States Code.

Nothing in this proposed legislation affects the amount of entitlement to active duty pay, retired pay, or survivor benefits of former, present, or future military members or their survivors. The legislation is believed necessary to permit DoD to budget and account for the cost of retired pay and survivor benefits on an accrual basis. Under this proposal, the president's budget for DoD will reflect DoD's incurred liability for future retirement benefits of the current active and reserve forces. Current payments to military retirees and their survivors would be made from this fund. Accruing liability for future retirement obligations in the DoD budget will be shown as an element of military personnel costs of the respective military departments.

This proposed legislation provides for financing military retirement on an accrual basis similar in most respects to the other major federal retirement systems. Because no fixed percentage of payments is prescribed in the legislation, the payments made by DoD to the fund each fiscal year could change as necessary, thereby minimizing the potential that any new unfunded retirement liability would occur. Such flexibility would permit the fund to adjust to changes in benefits, to increases in the number of personnel entitled to receive benefits, and to unanticipated changes in compensation upon which benefits payable from the fund are calculated.

DoD Legislative Proposal 96-22

Active duty training for reserve officers

Also before Congress is legislation designed to provide greater training flexibility for reserve component officers ordered to active duty for training of less than six months. If passed, the bill would delete the Military Selective Service Act's requirement that ROTC officers be ordered to active duty for not less than three months.

Generally, reserve component officers who perform active duty for training from three to six months fulfill their obligation through attendance at a training course designed to qualify them for duty in case of mobilization. Some of these courses are shorter than three months, and, under the current law, a reserve officer who finishes such a course must remain on active duty for another three weeks. Because of the short duration of this remaining active-duty obligation, the officer is of minimal utility and his retention results in the expenditure of unnecessary funds. Deletion of the requirement that a reserve component officer be ordered to active duty for at least three months will permit him to be released upon completion of a training course that is less than three months long.

DoD Legislative Proposal 96-6

Family separation allowance for junior enlisted

A proposed amendment to Title 37 of the United States Code would authorize family separation allowance for military members in pay grades of E-4 and below with dependents. The allowance is payable when an eligible member is separated from his dependents as a result of compliance with competent orders. It offers partial reimbursement to members involuntarily separated from their dependents for the average extra expenses that result from the separation.

Under present law, all members except those in grades E-4 and below are entitled to a family separation reimbursement of $30 per month. Thus, the entitlement is denied to those members least able to meet the additional cost of maintaining two households. If enacted, this legislation would help reduce the financial hardship faced by married, junior enlisted personnel who are serving unaccompanied tours at overseas locations, thereby correcting an inequity in existing law.

Women aboard Navy warship

Fifty-five women crewmembers are aboad a Navy repair ship in the Mediterranean. The Vulcan is the first American warship to deploy on an extended cruise with women as crewmembers.

The Navy downplayed the departure in an effort to reduce publicity and to make operating conditions as close to normal as possible. Navy officials plan to observe the effect of the rigors of life at sea on the women sailors and their conduct while on foreign liberty. The women have already proven themselves capable of serving on ships in stateside operations.

The Vulcan, with a total crew of about 730, is authorized to carry 66 female crewmembers.

Army National Guard to use AFEES

Nearly 2,000 of the 9,000 Army National Guard recruits who entered training in FY78 had to be released under the trainee discharge program. In an attempt to cut these losses, the National Guard Bureau has directed Commanders to reduce the utilization of home stations for processing of potential recruits and increase the utilization of the Nation's 66 Armed Forces Examining and Entrance Stations.

It is hoped that this action will improve processing and enable technicians and recruiters at home units to spend more time on unit activities. Improved processing would lower the number of recruits sent home from basic and advanced individual training because of incomplete processing. It also would reduce the time a recruit must wait before starting training.

Taking a similar initiative, the Army Reserve reduced its attrition rate by 50 percent after it began processing recruits through Armed Forces Examining and Entrance Stations.

U.S. Army photo

Sara Elisabeth Lister

Army selects new General Counsel

Sara Elisabeth Lister has been appointed General Counsel of the Army. Mrs. Lister, a former Deputy General Counsel of the Navy, is a 1974 graduate of The National Law Center, George Washington University.

The General Counsel of the Army is the chief legal officer of the Army and serves as legal counsel to the Secretary. The General Counsel's responsibilities extend to any subject of law and to other matters as directed by the Secretary of the Army.

Turbine engine possible for XM-1 tanks

Rigorous tests of the XM-1 main battle tank, conducted over a five-month period at Fort Knox, Kentucky, indicate that a turbine engine can successfully power the tank in combat.

The Fort Knox tests were run with three pre-production tanks which had been refurbished and fitted with the engineering modifications designed to overcome shortcomings identified in earlier tests at Fort Bliss. During four months of testing at Fort Bliss, Army crews operated the tanks over a variety of terrain for the equivalent of four years' normal operation. The 13 types of failures that accounted for 75 percent of the total failures during testing at Fort Bliss were significantly reduced during equally rigorous testing at Fort Knox.

Defense officials now believe it is possible to meet the final reliability and durability goals on original schedule.

Another test cycle of 6,000 miles to test several minor changes began in early November. Further tests and design refinements will be made in 1980 before full-scale production begins.

Psychological data base to enhance training

Although the mechanical design of simulators is well understood, the interface between the man and the machine has not been fully explored. To this end, the U.S. Air Force has awarded Boeing Aerospace Company a 42-month contract to develop a data base applicable to the development of military simulators.

Under the contract, entitled Integrated Cuing Requirements Study, Boeing will compile a data base from pertinent psychological studies. The company will then develop a user's guide for simulator design emphasizing the interaction of physical and behavioral characteristics.

The Air Force is turning to ground-based simulators for flight-crew training because of the rising cost of fuel, equipment, and personnel. The study is designed to glean information about human perception which can be used to improve air-training devices.

Army exceeds goal for energy savings

The Army used 9.5 percent less energy in FY79 than it did in FY75, the year being used as the federal baseline. This represents a savings of 4.5 million barrels of oil, or roughly $86 million.

Energy consumption at Army industrial facilities fell 10 percent. This was attributable to a stringent monitoring of heating and cooling systems, added insulation, and properly maintained energy-using machinery. Consumption of petroleum fuels, including heating oils, fell 11.2 percent, for a savings of 1.7 million barrels of oil.

The Army's FY79 energy-conservation goal was an 8-percent reduction of the baseline. The actual 9.5-percent reduction was achieved despite continued mechanization, increased training missions, and construction of facilities.

Plaudits given for conservation effort

The Naval Air Station, Chase Field, Texas, has been named recipient of the Secretary of Defense Natural Resources Conservation Award for 1978. The award is presented annually to the military installation in the United States which has demonstrated, during a three-year judging period, the greatest progress in applying natural resource conservation principles in line with environmental and ecological objectives.

The conservation award program is designed to ensure maximum recreational use of military property, consistent with the military mission of the installation. Each of the four military services nominated one installation from which a selection committee made recommendations to the Secretary of Defense. The other nominees were the Marine Corps Logistics Base, Albany, Georgia, Tobyhanna Army Depot, Pennsylvania, and Shaw Air Force Base, South Carolina.

Air Force surpasses retention goal

The Air Force surpassed its FY79 career-force reentry objective of 15,500 by more than 1,300. The additional first-term reenlistments were attributed to the solid support of retention and reenlistment programs by commanders, the hard work of supervisors and career advisors in keeping quality airmen, and the implementation of career-motivating incentives. These included lump-sum payments of selected reenlistment bonuses, enhancement of the Career Airman Reenlistment Reservation System, and the reinstitution of the Delayed Reenlistment Program. In addition to these efforts the Air Force streamlined its reenlistment and retention operating programs.

While the FY79 reentry objective was exceeded, the Air Force is reviewing other initiatives aimed at improving retention.

Ruling expands legal assistance from unions

The Federal Labor Relations Authority ruled that unions that provide attorneys to members in bargaining units must provide them to non-members in the same unit. The FLRA determined that, under Executive Order 11491, agencies can charge unions with unfair labor practices when equal representation is denied. The Executive Order bars disparate treatment based solely on union membership.

The ruling was made in a dispute between the National Treasury Employees Union, the Treasury Department's Bureau of Government Financial Operations, and the U.S. Customs Service.

Army adopts weapon system

The U.S. Army has contracted Boeing Aerospace Company and Hughes Aircraft Company to manufacture the European-developed Roland air-defense missile. The Roland is the first European-designed major weapon system selected by the Army for production in the U.S. The contract award is a major step forward in enhancing NATO operational effectiveness through the use of common weapons. The Roland system has now been adopted by the military services of France, West Germany, and the United States and will be an essential element of NATO air defense well into the 1990s.

The production go-ahead for the short-range missile system followed an extensive test program in which the U.S.-built version of the Roland system demonstrated its ability to perform a vital air-defense mission. The Army estimates that this adoption of an existing European system, rather than the development of a new domestic one, saved between $350 and $600 million.

Roland was developed by Messerschmitt-Boelkow-Blohm of West Germany and SNI Aerospatiale of France. Euromissile, a joint-venture management company established by the two developers, has co-licensed Boeing and Hughes to produce the system in the U.S. Under the Army contract, Hughes will provide the missile guidance section, perform the missile's final assembly, and furnish radars and optical sights for the fire units. Boeing will produce the missile launchers, command transmitters, and fire-unit module. It also will assemble the complete fire unit and provide the missile warhead.

Army gives green light to GASOHOL tests

As the proponent of the Army's GASOHOL program, the Mobility Equipment and Research and Development Command (MERADCOM), Fort Belvoir, Virginia, will purchase 200-proof denatured ethyl alcohol, blend it with unleaded gasoline in existing fuel storage tanks, and test the mixture on its gasoline-powered vehicles and equipment. The use of GASOHOL (a trademark of Nebraska Agricultural Products Industrial Utilization Committee) in tactical vehicles and equipment is expected to reduce the Army's gasoline consumption.

It is hoped that the Army GASOHOL program will illuminate petroleum-related problem areas peculiar to the Army, particularly fuel-handling systems. The testing will include laboratory analyses, materials compatibility tests, engine static tests, and dynamometer tests. Also, a military procurement specification will be developed.

In time, the program will expand to the rest of Fort Belvoir and three other sites: Letterkenny Army Depot, Pennsylvania; Fort Lewis, Washington; and Red River Army Depot, Texas.

U.S. Army photo

Army Secretary Clifford Alexander initiates Army's GASOHOL test program.

news summary

Army testing mobile advanced-logistics system

The Army has initiated testing on two Decentralized Automated Services Support System (DAS-3) prototypes. DAS-3 features commercial computer systems installed in standard military ten-ton, semi-trailer vans. DAS-3 is the Army's most sophisticated, tactically qualified advanced-logistics system for the field and represents a major step toward enhancing the Army's worldwide logistical capability.

Designed by General Electric Space Division for the U.S. Army Computer Systems Command, the DAS-3 can be tailored to almost any field-mission requirement. The mobile system can accommodate commercially available equipment and can be operated by Army personnel after minimal training. Frequency power converters make the vans adaptable to commercial power sources and field generators around the world.

Female cadets slated for pilot training

Twenty-five female members of the United States Air Force Academy's 1980 graduating class are scheduled to enter pilot training during the summer. The Air Force began training women officers as pilots two years ago, but the female cadets would be the first women graduates of the academy to enter the pilot training program.

Most women now in the pilot training program fly trainers or become instructors for the Air Training Command; however, it is expected that women will fly combat planes and bombers in the future.

AFSC cited for support of disadvantaged firms

Deputy Secretary of Defense W. Graham Claytor, Jr., commended the Air Force Systems Command and its Space Division for support of the Defense Department's Small Disadvantaged Business Program. The citation recognized the command's strong support of the program as evidenced by its contract awards to disadvantaged firms.

The Air Force Systems Command directed each of its field contracting activities to identify a high-dollar value, high-technology requirement and to make a special effort to locate a small disadvantaged firm for the contract. In response, the Space Division has entered into the Defense Department's highest Small Business Administration contract of this type. The contract valued at $14.2 million was awarded to the Technology Development Corporation of Sunnyvale, California.

The DoD Small Disadvantaged Business Program was established to ensure that the small, disadvantaged business sector is developed and utilized, thus strengthening the Nation's industrial base. Competition between defense suppliers will be more heated, causing prices for defense purchases to drop, and domestic sources for defense requirements will become more abundant, reducing the dependency on foreign sources.

Automated coding being tested

The Department of Defense is testing the use of bar coding and optical character recognition to establish standard symbology for use in logistics. The project, entitled Logistics Applications of Automated Marking and Reading Symbols (LOGMARS), was initiated in 1976 by the Assistant Secretary of Defense for Manpower, Reserve Affairs and Logistics. If officially adopted, LOGMARS would result in replacement of manual data procedures with automated reading methods. It is believed that such a change would lead to improved accuracy, productivity, and timeliness in processing materiel and documents.

After examining the various symbologies in existence, a DoD joint steering group selected two full-alphanumeric symbologies for testing. It will consist of prototype and laboratory tests. The prototype test will combine field tests with specific functional applications to transportation linkage and vendor marking. Laboratory tests will be conducted in controlled environments to evaluate the strengths and deficiencies of various materials for use as labels, tags, and equipment.

If adopted, the approach will affect DoD as well as other government organizations and commercial suppliers. Future contracts may cite requirements for vendors to use the symbologies on items, unit packs, shipping containers, and some documents.

calendar

Event	Date	Place	Contact
Software Cost Estimating Seminar	Mar 3–4 Apr 7–8	Washington, DC Boston, MA	AIAA P.O. Box 91295 5959 W. Century Blvd. Los Angeles, CA 90009 (213) 670-2973
Electronic Warfare Systems & Technology Conference	Mar 10–11	Washington, DC	
Cost/Schedule Control Systems Criteria	Mar 17–19	Las Vegas, NV	Decision Planning Corporation 3184–A Airway Ave. Costa Mesa, CA 92626 (714) 549-4755
Data Utilization	Mar 24–26	San Francisco, CA	
Basic Employee and Labor Relations	Apr 7–11	Washington, DC	Special Programs Graduate School, USDA 356 National Press Building 529 14th St., N.W. Washington, DC 20045 (202) 447-3247
Federal Acquisition Procedures	May 26–30	Washington, DC	
The DoD FY81 RDT&E Budget—Outlook and Perspective	Apr 15–17	Washington, DC	Electronic Industries Association 2001 Eye St., N.W. Washington, DC 20006 (202) 457-4944
MTM Spring Conference for Standards and Research	Apr 23–25	Anaheim, CA	MTM West Coast Office 2043 Westcliff Dr. Newport Beach, CA 92660 (714) 631-3313
Essentials of Budgeting for Operating Managers	Apr 23–25 May 5–7 May 28–30	San Francisco, CA New York, NY Chicago, IL	American Management Association 135 West 50th St. New York, NY 10020 (212) 246-0800
Data Base Management	Apr 24–25 May 5–6 May 19–20	Washington, DC Chicago, IL Cambridge, MA	Center for Management Research (Conference Coordinators for Harvard University Lab for Computer Graphics) ATTN: Ms. Karen Smolens 850 Boylston St. Chestnut Hill, MA 02167 (617) 738-5020
The American Society for Quality Control 34th Annual Technical Conference	May 20–22	Atlanta, GA	American Society for Quality Control 161 West Wisconsin Ave. Milwaukee, WI 53203 (414) 272-8575

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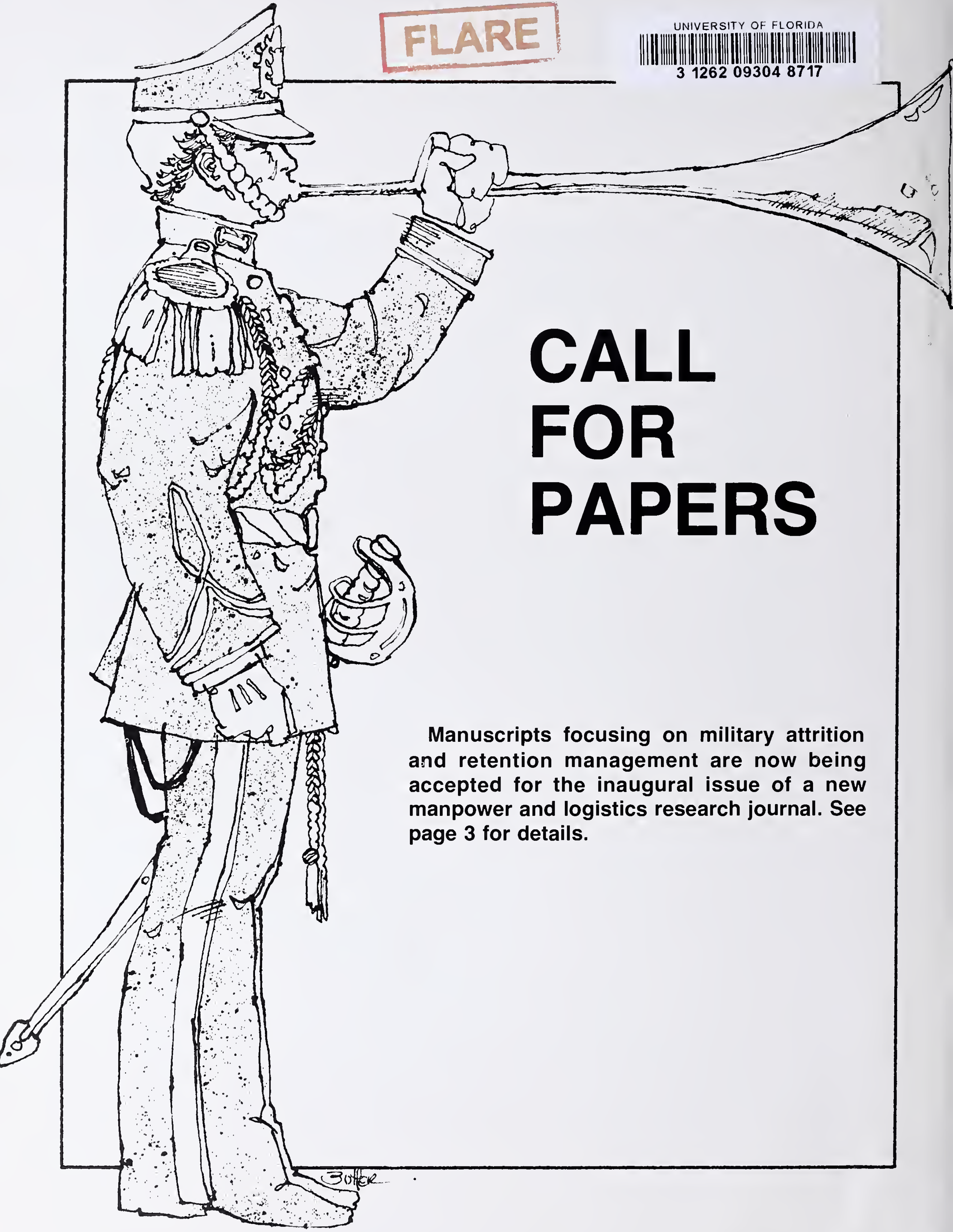

CALL FOR PAPERS

Manuscripts focusing on military attrition and retention management are now being accepted for the inaugural issue of a new manpower and logistics research journal. See page 3 for details.